

APPENDIX VII
ACUTE TOXICITY TEST RESULTS

Volume II

**Evaluation of the Effects of AFFF Inputs on the
VIP Biological Nutrient Removal Process and Pass-Through Toxicity**

PHASE 1A

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Naval Research Laboratory

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**Civil and Environmental Engineering Department
Old Dominion University
October 1997**

Project No. N00014-96-1-G021

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13. ABSTRACT (Maximum 200 words) <p>This report discusses the results of a bench scale study conducted to evaluate the potential inhibitory effects of untreated AFFF wastewater to the Virginia Initiative Plant (VIP) biological nutrient removal process. A bench-scale study was conducted to evaluate the potential inhibitory effects of untreated AFFF wastewater to the nitrification process of the Virginia Initiative Plant biological nutrient removal system. Under this testing, bench-scale reactors simulating the nitrification process were loaded at various AFFF concentrations and the influence on the process performance was evaluated. The purpose of this effort was to determine the level of AFFF that could be incorporated into the influent of a biological nutrient removal process without causing inhibitory effects. The results of the nitrification inhibition study showed that the AFFF concentrations tested in the range between 10 ppm to 60 ppm did not show any significant inhibition to biological nitrification. The effluent from each reactor did not exhibit any pass-through toxicity as well.</p>				
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APPENDIX VII
ACUTE TOXICITY TEST RESULTS

ACUTE TOXICITY TEST RESULTS

10 ppm AFFF

MARCH 11, 1997

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 636

Sample ID: A-1

JRA ID: 97-2726

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlone
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-2726

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:32</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.59 - 8.05</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2726 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2726 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-2726

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>17:05</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.58 - 8.03</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2726 Test Type&Organism: Acute (*Cyprinodon variegatus*)

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA # 97-2726 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/17/97

Result (mg/L) 33

QC Range (mg/L) 1 thru 36

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# 636

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU Norfolk VA

County _____

Pipe/Outfall/Location _____

NPDES# A-1. 8 Hr.

Instream Waste Conc _____

Sample collected by (print&sign) _____

H. YANG

Affiliation _____

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

_____(Composite):

From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number A-1. 8 Hr.

Frequency of collection _____

Volume 2 LTemperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____

Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No.dechlorinated? No.

If so, how? _____

Permit with interim chlorine limit? No.

If yes - limit (mg/L) _____

Field pH 7.41

Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reed

Print & Sign Names

1/ Relinquished by H. YANG Date 3-11-97 Time 9 P.M.Received by Kath CufelDate 3-12-97Time 09002. Relinquished by Kath CufelDate 3-12-97Time 0915

#636

Received by Althea MillerDate 3/12/97Time 0920

See PWC C-0-C

FOR REED LAB USE ONLY

JRA# 97-2726Arrival Temperature 1.8°COn ice? yesColor light orangeOdor earthySolids nonepH 7.88DO (mg/L) 9.0Conductivity (umhos/cm) 1800@ 20.1 °CSalinity (ppt) 1TRC (mg/L) -Method -



OBSERVATIONS

JRAH 97-2729

NPDES#: N/A

CLIENT: Deana - DM

OUTFALL: A-1

3

ORGANISM SOURCE: ABS

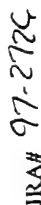
JRA BATCH#: C204

HATCH DATE: 3/8/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



OBSERVATIONS

Acute *Mysidopsis bahia* Toxicity Test

NPDES#: N/A

CLIENT: Deena - Del

09/

OUTFALL:

3

WATCH DATE: 3/11-12/97 1500-0800

JIRA BATCH#: M451

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* "

GENERAL COMMENTS

JRA# 77-2726NPDES#: NIA CLIENT: Ocean ODUOUTFALL: A-1 ³

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	8.03	✓	9.1	✓	1	20	✓	✓

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12/97 Date 3/13/97 Date 3/13/97 Date 3/14/97
 Method 1825 Method 0953 Method 1817 Method 1030
 Minutes 053 Amount LOG Amount LOG Amount 053

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DSB
Control	1000	100	0	0/1000	NUMBER OF ORGANISMS	DSB		
6.25			62.5		STATISTICAL ANALYSES	NIA		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: <u>DSB</u>								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	DSB
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Bentley VWR</u>	digi-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 637

Sample ID: A-2

JRA ID: 97-2727

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Claiborne
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-2727

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:34</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.61 - 8.05</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.0</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2727 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-2727

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>17:02</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.55 - 7.98</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2727 Test Type&Organism: Acute (*Cyprinodon variegatus*)

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2727 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/17/97

Result (mg/L) 33

QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# 637

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODU.Address ODU. Norfolk, VA.

County _____

Pipe/Outfall/Location _____

NPDES# A-2 8 Hr.

Instream Waste Conc _____

Sample collected by (print&sign) M. YANG

Affiliation _____

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

_____(Composite): From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number A-2, 8 Hr. Frequency of collection _____Volume 2 L.Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? No Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? No. If so, how? _____Permit with interim chlorine limit? No If yes - limit (mg/L) _____Field pH 7.51

Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reel

Print & Sign Names

1.	Relinquished by <u>M. YANG</u>	Date <u>03/11/97</u>	Time <u>9 PM</u>	#637 A-2 as
	Received by <u>Keith C. Lyle</u>	Date <u>3-12-97</u>	Time <u>0900</u>	
2.	Relinquished by <u>Keith C. Lyle</u>	Date <u>3-12-97</u>	Time <u>0915</u>	
	Received by <u>Althea Miller</u>	Date <u>3/12/97</u>	Time <u>0920</u>	

See PWC C-0-C

FOR REED LAB USE ONLY

JRA# 97-2727 Arrival Temperature 1.8°C On ice? YesColor tan Odor earthy Solids nonepH 8.08 DO (mg/L) 9.7 Conductivity (µmhos/cm) 1800 @ 12.8°CSalinity (ppt) 1 TRC (mg/L) - Method -



OBSERVATIONS

JRA# 97-2727

NPDES#: N/A

NPDES#: N/A
ORGANISM SOURCE: ACS

CLIENT: Deana - DM

JRA BATCH#: C204

OUTFALL: A-2
WATCH DATE: 3/8/97

4

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

OBSERVATIONS

acute *Mysidopsis bahia* Toxicity Test

VPDES#: N/A

CLIENT: Deena - Du

Qc1

OUTFALL: A-2

HATCH DATE: 3/11-12/97 1500-0800

[illegible]

" C variegatus "

GENERAL COMMENTS

JRA# 77-2727



NPDES#: N/A CLIENT: Oceana ODU

OUTFALL: A-2 4

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	7.97	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date _____ Date _____ Date _____ Date 3/12 3/13 3/13 3/14
 Method _____ Method _____ Method _____ Time 1825 0953 1817 1030
 Minutes _____ Amount _____ Amount _____ Init 053 106 106 053

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			053
Control	1000	100	0	dilute to 1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: MYSIDOPHORE VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	000 226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	053 Buxton VWR	digi-thermo	053 745 QCI	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 638

Sample ID: A-3

JRA ID: 97-2728

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Cloutier
ja Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-2728

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.62 - 8.01</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2728 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-2728 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-2728

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:20

Test End: Date 3/14/97 Time 16:59

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.04</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2728 Test Type&Organism: Acute (*Cyprinodon variegatus*)

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2728Test Type&Organism: Acute *Cyprinodon variegatus***TEST RESULTS** (Continued)3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility Dept. Civil & Environ. Eng. ODU
Address ODU Norfolk, VA

County _____ Pipe/Outfall/Location _____
NPDES# A-3 8Hr. Instream Waste Conc _____

Sample collected by (print&sign) H. YANG Affiliation _____

Type of sample ☒ (Grab): Date 03/11/97 Time 9 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number A-3 8Hr Frequency of collection _____ Volume 2 L

Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? _____

Permit with interim chlorine limit? No If yes - limit (mg/L) _____

Field pH 7.54 Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reel

Print & Sign Names

1. Relinquished by H. YANG Date 03/11/97 Time 9 PM

Received by Keith C. Felt Date 3-12-97 Time 0900 #638

2. Relinquished by Keith C. Felt Date 3-12-97 Time 0915

Received by Althea Driller Date 3/12/97 Time 0920

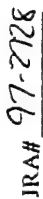
FOR REED LAB USE ONLY

JRA# 97-2728 Arrival Temperature 1.8°C On ice? yes

Color light yellow Odor earthy Solids none

pH 7.92 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 22.8°C

Salinity (ppt) 1 TRC (mg/L) — Method —



OBSERVATIONS

Acute *Mysidopsis bahia* Toxicity Test

NPDES#: N/A CLIENT: Oceana - OCU OUTFALL: A-3 5
ORGANISM SOURCE: Chesapeake (culture) JRA BATCH#: M451 HATCH DATE: 3/11/12 17 1500 - 0800

[illegible]

INIT	087	106	053		
DATE 1997	3/12	9/13	3/14		
TIME	1715	1150	1635		

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

JRA# 77-2728



NPDES#: N/A CLIENT: Oceana ODU

OUTFALL: A-3 5

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	7.98	/	9.1	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date _____ Date _____ Date _____ Date 3/12 3/13 3/13 3/14
 Method _____ Method _____ Method _____ Time 1825 0953 1817 1030
 Minutes _____ Amount _____ Amount _____ Init 053 L06 L06 053

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	40.01

TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
62.5	1000	100	0	0/1000 to 1000
12.5			125	
25			250	
50			500	
100			1000	

VERIFICATION
OF:VERIFIED
BY:TREATMENT
PREPARATION
CALCULATIONSNUMBER OF
ORGANISMSSTATISTICAL
ANALYSESANALYST
SIGNATURES

INITIALS

CALCULATIONS PERFORMED BY: 053

TEST CHAMBER SIZE: 250mL TYPE: Myster

VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	200
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	Baxton VWR	digi-thermo	745 QCI	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 639

Sample ID: B-1

JRA ID: 97-2729

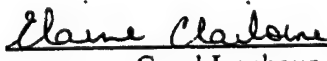
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,



for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-2729

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:25

Test End: 3/14/97 16:37

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>2</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 7.98</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2729 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.0</u>	<u>7.3 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		
Chlorine	<u>N/A</u>	
Salinity	<u>Forty Fathoms</u>	
pH	<u>N/A</u>	

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-2729 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147*	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-2729

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:20

Test End: Date 3/14/97 Time 16:57

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>2</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.51 - 7.95</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2729 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-2729Test Type&Organism: Acute (Cyprinodon variegatus)**TEST RESULTS** (Continued)3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# ⁶³⁹640639

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODU.Address ODU. Norfolk, VA

County _____

Pipe/Outfall/Location _____

NPDES# B-1, 8Hr.

Instream Waste Conc _____

Sample collected by (print&sign) _____

Affiliation _____

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

_____(Composite):

From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number B-1, 8Hr Frequency of collection _____Volume 2LTemperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

*It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? _____Permit with interim chlorine limit? No If yes - limit (mg/L) _____Field pH 7.61

Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reel

Print & Sign Names

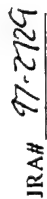
1.	Relinquished by <u>H. YANG</u>	Date <u>03/11/97</u>	Time <u>9 PM</u>
	Received by <u>Keith Cappel</u>	Date <u>3-12-97</u>	Time <u>0900</u>
2.	Relinquished by <u>Keith Cappel</u>	Date <u>3-12-97</u>	Time <u>0915</u>
	Received by <u>Retha Dineen</u>	Date <u>3-12-97</u>	Time <u>0920</u>

#639

FOR REED LAB USE ONLY

JRA# 97-2729 Arrival Temperature 18°C On ice? ☒Color light yellowOdor earthySolids nonepH 7.73DO (mg/L) 8.6Conductivity (µmhos/cm) 1800@ 21.3 °CSalinity (ppt) 2TRC (mg/L) N/A

Method _____



OBSERVATIONS

Acute *Cyprinodon variegatus* Toxicity Test

NPDES#: N/A CLIENT: Oceana - Off OUTFALL: B-1 6
ORGANISM SOURCE: ARS IRA BATCH#: C204 HATCH DATE: 3/8/97

CLIENT: Deana - DM

OUTFALL: B-1

HATCH DATE: 3/8/97

JRA BATCH#: C204

[illegible]

INIT	083	083	083		
DATE 19 97	3/12	3/13	3/14		
TIME	1720	1700	1657		

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



OBSERVATIONS

cure *Mysidopsis bahia* Toxicity Test

UPDES#: N/A

CLIENT: Diana - Del

OUTFALL: B-1-2

ORGANISM SOURCE:

JRA BATCH#: M451

HIATCH DATE: 3/11/97 1500-0802

[illegible]

(Indicate comments with an * and document on General Comments page.)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

JRA# 77-2729NPDES#: N/ACLIENT: Oceana ODUOUTFALL: B-1 6

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.6	7.90	/	9.0	/	42	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

MS

Date 3/12 Date 3/13 Date 3/14 Date 3/15
 Method 1825 Method 0953 Method 1817 Method 1030
 Minutes 083 Amount 406 Amount 406 Init 083

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			083
Control	1000	100	0	0	NUMBER OF ORGANISMS	083		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 083								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	003 226 003
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	003 VWR	digi-thermo	003 745 DC1	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 640

Sample ID: B-2

JRA ID: 97-2730

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlene
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-2730

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:25

Test End: Date 3/14/97 Time 16:55

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.61 - 8.03</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2730 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2730 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/13/97
Result (mg/L) 0.09
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-2730

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>16:39</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.04</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2730 Test Type&Organism: Acute Cyprinodon variegatus

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/17/97
Result (mg/L) 33
QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC# 640

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility Dept. Civil & Environ. Eng. ODU.

Address ODU. Norfolk. VA.

County _____

Pipe/Outfall/Location _____

NPDES# B-2, 8Hr.

Instream Waste Conc _____

Sample collected by (print&sign) H. YANG Affiliation _____

Type of sample ✓ (Grab): Date 03/11/97 Time 9PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number B-2 8Hr. Frequency of collection _____ Volume 2L.

Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? _____

Permit with interim chlorine limit? No If yes - limit (mg/L) _____

Field pH 7.65 Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reel

Print & Sign Names

1. Relinquished by H. YANG Date 03/11/97 Time 9PM

Received by Keith C. Felt Date 3-12-97 Time 0900

2. Relinquished by Keith C. Felt Date 3-12-97 Time 0915

Received by Atcher Miller Date 3/12/97 Time 0920

#640

FOR REED LAB USE ONLY

JRA# 97-2730 Arrival Temperature 1.8°C On ice? yes

Color light yellow Odor earthy Solids none

pH 7.82 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 25°C

Salinity (ppt) 1 TRC (mg/L) 40.0 Method N/A



Acute *Cyprinodon variegatus* Toxicity Test

JRA# 97-2130

NPDES#: N/A CLIENT: Oceana - Offu OUTFALL: B-2 7
ORGANISM SOURCE: ABS IRA BATCH#: C2ay HATCH DATE: 3/8/77

CLIENT. Deena - Odu

OUTFALL: B-2
HATCH DATE: 3/8/77

JURA BATCH#: C72d

ORGANISM SOURCE: ABS

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



ute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-2730

PDES#: N/A

CLIENT: Oceana - OCU

OUTFALL: B-2 7

ORGANISM SOURCE: Chesapeake (culture)

JRA BATCH#: 7451

HATCH DATE: 3/11-12/97 500-0800

Conc (%)	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	0	END
0	A		10	10	10	8.31	8.20	7.65	7.9	7.6	7.3	19.8	19.1	20	20
100	B		10	10	10										
6.25	A		10	10	10	8.30	8.17	7.64	8.1	7.7	7.3	19.8	19.1	20	20
100	B		10	10	10										
12.5	A		10	10	10	8.28	8.16	7.63	8.2	7.8	7.2	19.8	19.1	20	20
100	B		10	10	10										
25	A		10	10	10	8.25	8.14	7.62	8.4	7.8	7.2	19.9	19.1	20	20
95	B		10	9	9										
50	A		10	10	10	8.20	8.12	7.62	8.6	7.6	7.1	19.9	19.1	20	20
100	B		10	10	10										
100	A		10	10	10	7.95	8.03	7.61	9.1	7.5	7.1	19.7	19.1	21	21
100	B		10	10	10										

INIT	085	106	085
DATE 19 97	3/12	3/13	3/14
TIME	1725	1805	1655

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

JRA# 77-2730NPDES#: NIA CLIENT: Oceana ODUOUTFALL: B.2 7

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 2100	3/12/97	19.7	7.95	/	9.1	/	1	21	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12 Date 3/13 Date 3/13 Date 3/14
 Method 1825 Method 0953 Method 1817 Method 1030
 Minutes 053 Amount LOG Amount LOG Amount 053

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	0/1000	NUMBER OF ORGANISMS	053		053
6.25			62.5		STATISTICAL ANALYSES	NIA		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: 053								

TEST CHAMBER SIZE: 250mL TYPE: Mystyfer VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 203 26
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature 053 VWR digi-thermo 1046303 7AS QCI n/a
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A

COMMENTS:

March 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 641

Sample ID: B-3

JRA ID: 97-2731


Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,



ja Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-2731

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:51</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.55 - 8.08</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2731 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.6 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2731 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-2731

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:20

Test End: 3/14/97 16:44

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL •

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.52 - 8.06</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2731 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2731 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/17/97
Result (mg/L) 33
QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU Norfolk VA

County _____

Pipe/Outfall/Location _____

NPDES# B-3 8 Hr.

Instream Waste Conc _____

Sample collected by (print&sign) _____

H. YONG

Affiliation _____

Type of sample ☒ (Grab):Date 03/11/97Time 9 PM

_____(Composite):

From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number B-3 8 Hr. Frequency of collection _____Volume 2L.Temperature of sample in sample collection device 24.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____

Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? No. If so, how? _____Permit with interim chlorine limit? No. If yes - limit (mg/L) _____Field pH 7.69

Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reel

Print & Sign Names

1. Relinquished by H. YONG Date 03/11/97 Time 9 PMReceived by Kath C. J.Date 3-12-97Time 09002. Relinquished by Kath C. J.Date 3-12-97Time 0915Received by Atties MillerDate 3/12/97Time 0920

#641

FOR REED LAB USE ONLY

JRA# 97-2731Arrival Temperature 1.8°COn ice? yesColor light yellowOdor earthySolids nonepH 7.91DO (mg/L) 8.6Conductivity (umhos/cm) 1800@ 21.2 °CSalinity (ppt) 1TRC (mg/L) -Method -



OBSERVATIONS

JRA# 97-2731

NPDES#: N/A

CLIENT: Deana - Odu

OUTFALL: B-3

ORGANISM SOURCE: ABS

JRA BATCH#: C204

WATCH DATE: 3/8/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Recv 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

JRA# 77-2731NPDES#: N/A CLIENT: Oceana ODUOUTFALL: B-3 8

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 21:00	3/12/97	19.7	8.03	/	9.1	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/12/97 Date 3/13 Date 3/13 Date 3/14
 Method 1825 Method 0953 Method 1817 Method 1030
 Minutes 253 Amount LOG Amount LOG Amount 253

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	20.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DSB
CONT 101	1000	100	0	0/1000 to 1000	NUMBER OF ORGANISMS	DSB		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: DSB								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	DSB 226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	DSB <u>Bioxon VWR</u>	digi-thermo	DSB <u>745 DC1</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

March 21, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 635

Sample ID: Mix L. R.R.

JRA ID: 97-2725

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Carol Isenhour
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-2725

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.60 - 8.02</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2725 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2725 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-2725

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/12/97 Time 17:20

Test End: Date 3/14/97 Time 17:08

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.56 - 8.01</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.1</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test Known Parentage? <u>N/A</u>	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2725 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/17/97

Result (mg/L) 33

QC Range (mg/L) 1 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		

PWC # 635

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU, Norfolk, VA

County _____

Pipe/Outfall/Location _____

NPDES# Mix L. RR

Instream Waste Conc _____

Sample collected by (print&sign) H. YANG

Affiliation _____

Type of sample ✓ (Grab):Date 03/11/97Time 11 AM

_____(Composite):

From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number Mix L. RR

Frequency of collection _____

Volume 2 L.Temperature of sample in sample collection device 28.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? _____Permit with interim chlorine limit? No If yes - limit (mg/L) _____Field pH 7.25 Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment Reed

Print & Sign Names

1. Relinquished by H. YANG Date 03/11/97 Time 11 AM #635Received by Kath. Cuffel Date 3-12-97 Time 09002. Relinquished by Kath Cuffel Date 3-12-97 Time 0915Received by Catherine Miller Date 3/12/97 Time 0920See PWC C-0-C

FOR REED LAB USE ONLY

JRA# 97-2725 Arrival Temperature 1.8°C On ice? yesColor light yellow Odor earthy Solids nonepH 7.86 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1800 @ 20.1°CSalinity (ppt) 1 TRC (mg/L) — Method —



OBSERVATIONS

JRA# 97-2725

NPDES#: N/A CLIENT: Oceana - Opu OUTFALL: Mix L. of RR 2
ORGANISM SOURCE: APS JRA BATCH#: C204 HATCH DATE: 3/8/87

(Indicate comments with an * and document on General Comments page)



OUTFALL: MIXED. 1. 100

[illegible]

" C. variegatus "

GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: Mix L 2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/12/97	0	3/11/97 11:00	3/12/97	19.6	8.01	✓	9.1	✓	1	20	✓	✓

DO Adj. _____ pH Adj. _____ TRC Adj. _____ Feedings (*Mysid*)

Date _____ Date _____ Date _____ Date 3/12 3/13 3/13 3/14 _____
 Method _____ Method _____ Method _____ Time 1825 0953 1817 1030 _____
 Minutes _____ Amount _____ Amount _____ Init DSB LOC LOC DSB _____

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/12/97	0	3/12/97	19.8	8.31	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
<u>CONC 6.25</u>	<u>1000</u>	<u>100</u>	<u>0</u>	<u>21.072</u> <u>to 1000</u>	NUMBER OF ORGANISMS	<u>DSB</u>		<u>DSB</u>
<u>6.25</u>			<u>62.5</u>		STATISTICAL ANALYSES	<u>N/A</u>		
<u>12.5</u>			<u>125</u>					
<u>25</u>			<u>250</u>					
<u>50</u>			<u>500</u>					
<u>100</u>			<u>1000</u>	<u>0</u>				
CALCULATIONS PERFORMED BY: <u>DSB</u>								

TEST CHAMBER SIZE: 250mL TYPE: polythene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 3147 DSB
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature DSB VWR 7AS QCI n/a
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A
 COMMENTS: _____

March 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-080

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 634

Sample ID: Feed S.

JRA ID: 97-2724

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlone
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-2724

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:25</u>
Test End:	<u>3/14/97</u>	<u>16:51</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.47 - 7.49</u>	<u>7.65 - 8.31</u>
Adjusted	<u>N/A</u>	

JRA #: 97-2724 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.1</u>	<u>7.3 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-2724Test Type&Organism: Acute *Mysidopsis bahia***TEST RESULTS** (Continued)3. Statistical Results (as appropriate)

LC50		<u>17.7%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/13/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S JRA #: 97-2724

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/12/97</u>	Time <u>17:20</u>
Test End:	<u>3/14/97</u>	<u>16:48</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.47 - 7.70</u>	<u>7.69 - 8.31</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.1</u>	<u>7.7 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		
Chlorine	<u>N/A</u>	
Salinity	<u>Forty Fathoms</u>	
pH	<u>N/A</u>	

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-2724Test Type&Organism: Acute *Cyprinodon variegatus***TEST RESULTS** (Continued)3. Statistical Results (as appropriate)

LC50		<u>52%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/17/97</u>	
Result (mg/L)		<u>33</u>	
QC Range (mg/L)		<u>1</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		

PWC#634

Toxicity Test Sample Chain of Custody
(Please complete all information)

Facility Dept. Civil & Environ. Eng. ODUAddress ODU Norfolk VA.

County _____

Pipe/Outfall/Location _____

NPDES# Feed S

Instream Waste Conc _____

Sample collected by (print&sign) H. YANG

Affiliation _____

Type of sample ✓ (Grab):Date 03/11/97Time 11 AM

(Composite): From Date _____

Time _____

To Date _____

Time _____

Subsamples comprising composite:

Number Feed S

Frequency of collection _____

Volume 2 LTemperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? No If so, how? _____Permit with interim chlorine limit? No If yes - limit (mg/L) _____Field pH 6.74

Field Total Residual Chlorine _____

Comments/Sample description _____

Type of test(s) to be performed _____

(Specify organisms) _____

Method of shipment _____

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>03/11/97</u>	Time <u>11 AM</u>	<u>#634</u>
	Received by <u>K. Carranfield</u>	Date <u>3-12-97</u>	Time <u>0901</u>	
2.	Relinquished by <u>Ruth C. H.</u>	Date <u>3-12-97</u>	Time <u>0915</u>	
	Received by <u>Catherine Miller</u>	Date <u>3/12/97</u>	Time <u>0920</u>	

See PWC COC.

FOR REED LAB USE ONLY

JRA# 97-2724 Arrival Temperature 1.0°C On ice? yes

Color light orange Odor yeast Solids none

pH 7.12 DO (mg/L) 9.8 Conductivity (umhos/cm) 1600 @ 19.8°C

Salinity (ppt) 1 TRC (mg/L) - Method -



& ANALYSIS REQUEST FORM

COMPANY/COMMAND: Ocean CODE:
CONTACT: Douglas Kirk
PHONE: 433-3439 EXT: FAX:
J.O. #: 1912290
SIGNATURE:
PERMIT NO.:

CLIENT INFORMATION

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											pH	TEMPERATURE	OTHER
634	634	Feed S.	START	3/1/97	1100	G	HY	L		1	Biogassam	97-2724		ABN
635	635	Mix L. RR	START		1100							97-2725		
636	636	A-1	START		2100							97-2726		
637	637	A-2	START		2100							97-2727		
638	638	A-3	START		2100							97-2728		
639	639	B-1	START		2100							97-2729		
640	640	B-2	START		2100							97-2730		

TYPE	MATRIX	CONTAINER	PRESERVATIVE							
			1. COOL TO 4 C	2. HNO ₃ PH<2	3. H ₂ SO ₄ PH<2	4. NaOH PH>12	5. HCL PH<2	6. 0.008% Na ₂ S ₂ O ₃ 4 C	7. FIELD FILTER	8. NONE
G - GRAB	L - LIQUID	P - PLASTIC								
CF - COMPOSITE FLOW	S - SOLID	GIL - GLASS								
CT - COMPOSITE TIME	GS - GAS	T - TEFLON								
	SS - SEMI SOLID	V - VOAC								

TURNAROUND (days): _____ (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS: _____

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 1.8°C

REGULATION APPLIED:

RCRA () HRSD ()
SDWA () TSCA ()
CWA () PHOTO ()
CAA () OTHER ()

SAMPLING/COLLECTION CHARGE: \$ _____

POSSIBLE SAMPLE HAZARDS: _____

COMMENTS: _____

D.O. NUMBER: _____ INIT.: _____
CONTRACT LAB: _____ DATE: _____
CONTRACT NO.(S): _____ OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY: CHECK BOX INITIALS OKAY

HOLDING TIME () CONTAINERS () INITIAL: _____ REJECTED () REASON: _____

RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/12/97 0955
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/12/97 1035
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/12/97 1035
RELINQUISHED BY: Chad REC'D BY: Chad COMPANY/COMMAND: Ocean DATE/TIME: 3/12/97 1035

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



ENVIRONMENTAL

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.: Douglas Kirk
COMMAND: Debra

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS			PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER	
0001	B-3	START	3/2/97	11:00	G	HY	L	1	1	Bioremediation		97-2731		ASR
0002		STOP												
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Acute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-2724

NPDES#: N/A CLIENT: Oceana - OCU OUTFALL: Feed S. 1
ORGANISM SOURCE: Chesapeake (culture) JRA BATCH#: M451 HATCH DATE: 3/11-12/97 1500-0800

Conc. (%)		REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)				DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
%Surv.				0	24	48	0	24	48	0	24	48	0	24	48	0	END		
0		A		0	24	48	8.31	8.20	7.65	7.2	7.6	7.3	19.8	19.7	20.0	20	20		
100		B		10	10	10	8.30	7.87	7.65	8.0	7.6	8.2	19.9	19.7	20.0	20	20		
6.25		A		10	10	10	8.27	7.85	7.67	8.1	7.4	8.1	19.9	19.7	20.0	20	20		
100		B		10	10	10	8.16	7.81	7.69	8.3	7.0	8.0	19.9	19.7	20.0	20	20		
12.5		A		10	10	8	8.01	7.55	-	8.5	0.1	-	20.0	19.7	-	20	20		
90		B		10	10	10	8.01	7.55	-	9.1	0.1	-	20.0	19.7	-	20	20		
25		A		10	3	2	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		
10		B		10	1	0	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		
50		A		10	0	-	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		
0		B		10	0	-	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		
100		A		10	0	-	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		
0		B		10	0	-	8.01	7.55	-	8.1	0.1	-	20.0	19.7	-	20	20		

Low DO even with aeration ~100 bubbles/min

INIT	100	100
DATE 19 97	3/12	3/13
TIME	1700	1651

(Indicate comments with an * and document on General Comments page)

LC50 = 52%

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/12/97 TEST NUMBER: 97-2724 DURATION: 48 hours
TOXICANT : Feed S.
SPECIES: C. variegatus

RAW DATA:	Concentration	Number	Mortalities
---	----	Exposed	
	.00	20	0
	6.25	20	1
	12.50	20	0
	25.00	20	2
	50.00	20	7
	100.00	20	20

SPEARMAN-KARBER TRIM: 2.50%

SPEARMAN-KARBER ESTIMATES: LC50: 52.35
95% LOWER CONFIDENCE: 43.49
95% UPPER CONFIDENCE: 63.02

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

ACUTE TOXICITY TEST RESULTS

30 ppm AFFF

MARCH 19, 1997



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 670

Sample ID: A-1

JRA ID: 97-3154

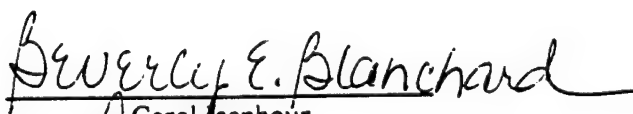
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3154

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/20/97 Time 16:00

Test End: 3/22/97 15:54

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.12 - 8.13</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3154 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3154 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3154

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:33</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.12 - 8.21</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3154 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.6</u>	<u>7.5 - 7.9</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3154 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241
County Pipe/Outfall/Location
NPDES# Instream Waste Conc
Sample collected by (print&sign) yang Affiliation
Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM
 (Composite): From Date Time
To Date Time

Subsamples comprising composite:

Number A-1. 8 Hr. Frequency of collection Volume 2 L.

Temperature of sample in sample collection device 28.5°C.

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? No If yes - limit (mg/L)

Field pH 7.50 Field Total Residual Chlorine

Comments/Sample description A-1. 8 Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

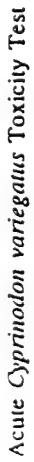
Method of shipment

Print & Sign Names

1.	Relinquished by <u>yang</u>	Date <u>03/19/97</u>	Time <u>20:00 PM</u>
	Received by <u>Douglas C. Kail</u>	Date <u>3-20-97</u>	Time <u>Noon</u>
2.	Relinquished by <u>Douglas C. Kail</u>	Date <u>3-20-97</u>	Time <u>12:20</u>
	Received by <u>A. Angeles</u>	Date <u>3/20/97</u>	Time <u>1245</u>

FOR REED LAB USE ONLY

JRA# 97-3154 Arrival Temperature 2.9 On ice? yes
Color tan Odor earthy Solids none
pH 6.88 DO (mg/L) 8.5 Conductivity (µmhos/cm) 1800 @ 19.5°C
Salinity (ppt) 1 TRC (mg/L) — Method —



JRA# 97-354

OUTFALL: A-1

HATCH DATE: 3/17/97

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

JRAH 97-3154

cute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

PDES#: N/A

CLIENT: Ocean - Odu
Cultures JRA B

QJ
JRA BATCH#: 1453

OUTFALL: A-1

IIATCH DATE: 3/9-20/97 1500-0800

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. Variegatus* " "

GENERAL COMMENTS

JRA# 97-3154

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: A-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.5	7.12	✓	8.6	✓	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22
 Method 1630 Method 1205 Method 1730 Method 1020
 Minutes 106 Amount 106 Amount 153 Amount 106

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

VERIFICATION OF:

VERIFIED BY:

ANALYST SIGNATURES

INITIALS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
Control	1000	100	0	21.472 to 1000	NUMBER OF ORGANISMS	153		153
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				

CALCULATIONS PERFORMED BY: 153TEST CHAMBER SIZE: 250 mLTYPE: polystyreneVOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT

Make

Model

Serial Number

Probe Number

pH meter

Corning

245

5147

2000 266

DO meter

YSI

54ARC

14522

N

SCT meter

YSI

33

4458

A

Temperature

VWR

digi-thermo

745 GC1

n/a

Chlorine

Fischer & Porter

821A0091J23

8311A940230-1

A

COMMENTS:

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 668

Sample ID: A-2

JRA ID: 97-3152

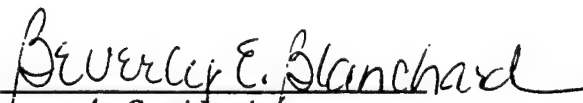
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3152

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>15:58</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.96 - 8.22</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3152 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.9 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3152 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/24/97
Result (mg/L) 0.09
QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3152

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.96 - 8.20</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3152 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.6</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3152 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	<u>Corning</u>	<u>245</u>	<u>5147</u>	<u>G</u>
DO meter	<u>YSI</u>	<u>54ARC</u>	<u>14522</u>	<u>N</u>
SCT meter	<u>YSI</u>	<u>33</u>	<u>4458</u>	<u>A</u>
Temperature	<u>VWR</u>	<u>digi-thermo</u>	<u>7A5 QC1</u>	<u>N/A</u>
Chlorine	<u>Fischer</u>			
	<u>& Porter</u>	<u>821A009423</u>	<u>8811A940230-1</u>	<u>A</u>

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY

Address CIVIL & ENV. TAL ENG. DEPT.

KDH 135 NORFOLK VA 23529-0241

County Pipe/Outfall/Location

NPDES# Instream Waste Conc

Sample collected by (print&sign) yang Affiliation

Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM

 (Composite): From Date Time

To Date Time

Subsamples comprising composite:

Number A-2. 8Hr Frequency of collection Volume 2L.

Temperature of sample in sample collection device 28.5°C

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? If yes - limit (mg/L)

Field pH 7.54 Field Total Residual Chlorine

Comments/Sample description A-2. 8Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:00 PM

Received by Dylan S. Kirk Date 3-20-97 Time Noon

2. Relinquished by Dylan S. Kirk Date 3-20-97 Time 12:20

Received by Q. Daniels Date 3/20/97 Time 1245

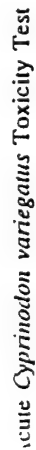
FOR REED LAB USE ONLY

JRA# 97-3152 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.69 DO (mg/L) 8.6 Conductivity (µmhos/cm) 1800 @ 19.6°C

Salinity (ppt) 1 TRC (mg/L) - Method -



OBSERVATIONS

JRAH 97-3152

#SJDdr
N/A

CLIENT:

Deena- Odu

CLIENT:

Q14

JIRA BATCH#: C205

OUTFALL: A-2
HATCH DATE: 3/17/97

OUTFALL: A=2

ORGANISM SOURCE: ABS

JRA BATCH#: C205

WATCH DATE: 3/17/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

OBSERVATIONS

JRA# 97-3152

PPES#:
N/A

CLIENT: Ocean - Oil

PPDES#: N/A CLIENT: Cultures
ORGANISM SOURCE: Chesapeake

Arana - Ora

OUTFALL: A-2

HATCH DATE: 3/19-20/97 1500. 0800

[illegible]

" C. Variegatus " " "

GENERAL COMMENTS

JRA# 97-3152NPDES#: N/A CLIENT: Oceana ODUOUTFALL: A-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/20/97	0	3/19/97 2000	3/20/97	19.6	6.96	/	8.6	/	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22
 Method 1430 Method 1205 Method 1730 Method 1020
 Minutes Amount Amount Init LOC LOC BS LOC

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	<u>BS</u> 7.70	7.9	20	12.91

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	214.28 To 1000	NUMBER OF ORGANISMS	BS		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500	✓				
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Comine	245	5147	<u>BS</u> <u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>BS</u> <u>Banion VWR</u>	digi-thermo	<u>BS</u> <u>7A5 QCI</u>	N/A
Chlorine	Fischer & Porter	321A009U23	3811A940230-1	A

COMMENTS:

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 667

Sample ID: A-3

JRA ID: 97-3151

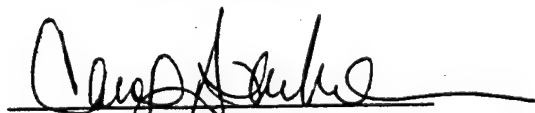
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3151

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>16:01</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.90 - 8.11</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3151 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.6</u>	<u>7.0 - 8.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3151 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/24/97

Result (mg/L) 0.09

QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3151

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:38</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.90 - 8.18</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3151 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.6</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3151 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241

County Pipe/Outfall/Location
NPDES# Instream Waste Conc

Sample collected by (print&sign) yang Affiliation

Type of sample ✓ (Grab): Date 3/19/97 Time 20:00 PM

 (Composite): From Date Time

To Date Time

Subsamples comprising composite:

Number A-3, 8Hr Frequency of collection Volume 2L

Temperature of sample in sample collection device 28.5°C

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? No If yes - limit (mg/L)

Field pH 7.50 Field Total Residual Chlorine

Comments/Sample description A-3, 8Hr

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Box

Print & Sign Names

1.	Relinquished by <u>yang</u>	Date <u>03/19/97</u>	Time <u>20:00 PM</u>
	Received by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>Now</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>12:20</u>
	Received by <u>[Signature]</u>	Date <u>3/20/97</u>	Time <u>12:45</u>

FOR REED LAB USE ONLY

JRA# 97-3151 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.64 DO (mg/L) 8.5 Conductivity (µmhos/cm) 1800 @ 19.7°C

Salinity (ppt) 1 TRC (mg/L) — Method —



OBSERVATIONS

JRA# 97-3151

NPDES#: N/A CLIENT: Ocean - Old OUTFALL: A-3
ORGANISM SOURCE: Chesapeake Bay IRA BATCH#: M453 HATCH DATE: 3/10/2017 1500-0800

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

11 C. Variegatus

JRA# 97-3151




NPDES#: N/A CLIENT: Oceana ODU OUTFALL: A-3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)												
DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.7	6.90	/	8.6	/	1	20	-	-

Date	Date	Date	Date	3/20	3/21	3/21	3/22
Method	Method	Method	Time	1630	1205	1730	1020
Minutes	Amount	Amount	Init	LXC	LXC	153	LXC

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	214.72 To 1000	NUMBER OF ORGANISMS	BS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY:								

TEST CHAMBER SIZE: <u>250 mL</u>		TYPE: <u>polypropylene</u>		VOLUME OF TEST SOLUTION: <u>200 mL</u>	
<u>EQUIPMENT</u>	<u>Make</u>	<u>Model</u>	<u>Serial Number</u>	<u>Probe Number</u>	
pH meter	Cornine	245	5147	<u>2003</u> <u>226</u>	
DO meter	YSI	54ARC	14522	<u>N</u>	
SCT meter	YSI	33	4458	<u>A</u>	
Temperature	<u>2003</u> <u>VWR</u>	digital-thermo	<u>2003</u> <u>146203</u> <u>7AS GC1</u>	<u>na</u>	
Chlorine	Fischer & Porter	321A009U23	8811A940230-1	<u>A</u>	

COMMENTS:



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 664

Sample ID: B-1

JRA ID: 97-3148

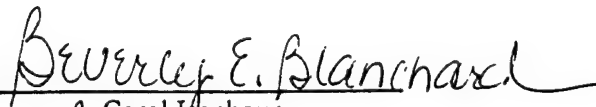
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,



Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3148

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/20/97 Time 16:00

Test End: 3/22/97 16:02

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.09</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3148 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 8.6</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>95</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #:

97-3148

Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
	Result (mg/L)	<u>0.09</u>	
	QC Range (mg/L)	<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3148

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:40</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.17</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3148 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.6</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3148 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/24/97

Result (mg/L) >40

QC Range (mg/L) 2 thru 36

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241

County Pipe/Outfall/Location

NPDES# Instream Waste Conc

Sample collected by (print&sign) yang Affiliation

Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM

 (Composite): From Date Time

To Date Time

Subsamples comprising composite:

Number B-1, 8 Hr Frequency of collection Volume 2L

Temperature of sample in sample collection device 28.5°C

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? No If yes - limit (mg/L)

Field pH 7.50 Field Total Residual Chlorine

Comments/Sample description B-1, 8 Hr

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

- | | | | |
|----|------------------------------------|----------------------|----------------------|
| 1. | Relinquished by <u>yang</u> | Date <u>03/19/97</u> | Time <u>20:00 PM</u> |
| | Received by <u>[Signature]</u> | Date <u>3-20-97</u> | Time <u>Now</u> |
| 2. | Relinquished by <u>[Signature]</u> | Date <u>3-20-97</u> | Time <u>12:20</u> |
| | Received by <u>[Signature]</u> | Date <u>3/20/97</u> | Time <u>1245</u> |

FOR REED LAB USE ONLY

JRA# 97-3148 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.48 DO (mg/L) 8.5 Conductivity (umhos/cm) 1800 @ 19.8°C

Salinity (ppt) 1 TRC (mg/L) - Method -



JRA# 97-3148

$$\frac{5}{2}$$

CLIENT:

Державна - Одва

OUTFALL: 3.1

OUTFALL: 3-1
HATCH DATE: 3/17/97

ORGANISM SOURCE: ABS

JRA BATCH#: C205

3/17/97

(Indicate comments with an * and document on General Comments page)

" *C. Variegatus* "

GENERAL COMMENTS

JRA# 97-3148

NPDES#: N/A CLIENT: Oceana ODU OUTFALL: B-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/24/97	0	3/19/97 2000	3/24/97	19.8	6.89	✓	8.6	✓	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

Date 3/20 Date 3/21 Date 3/21 Date 3/22
 Method 1630 Method 1205 Method 1730 Method 1020
 Minutes 106 Amount 106 Amount 153 Amount 106

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/24/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	81.472 To 1000	NUMBER OF ORGANISMS	BS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 @BS 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature @BS VWR digi-thermo @BS 745 QCI n/a
 Chlorine Fischer & Porter 321A009U23 8811A940230-1 A

COMMENTS: _____



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 665

Sample ID: B-2

JRA ID: 97-3149

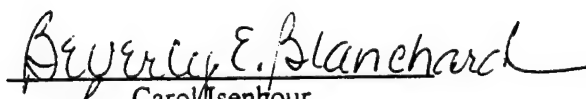
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3149

Test Period for Which Data is Being Submitted:
(i.e., first quarter, semiannual, or annual) _____

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>16:05</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.17</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3149 Test Type&Organism: Acute Mysisidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.8 - 8.9</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3149 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3149

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/20/97 Time 15:50

Test End: 3/22/97 15:43

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 3 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.89 - 8.11</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3149 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.0 - 8.9</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3149 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241

County Pipe/Outfall/Location
NPDES# Instream Waste Conc

Sample collected by (print&sign) yang Affiliation

Type of sample ☒ (Grab): Date 3/19/97 Time 20:00 PM

 (Composite): From Date Time

To Date Time

Subsamples comprising composite:

Number B-2, 8 Hr. Frequency of collection Volume 2L.

Temperature of sample in sample collection device 28.5C

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? No If yes - limit (mg/L)

Field pH 7.47 Field Total Residual Chlorine

Comments/Sample description B-2 8 Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reed

Print & Sign Names

- Relinquished by yang Date 03/19/97 Time 20:00 PM
Received by Angela S. Kirk Date 3-20-97 Time None
- Relinquished by Angela S. Kirk Date 3-20-97 Time 12:20
Received by A. Angelo Date 3/20/97 Time 1245

FOR REED LAB USE ONLY

JRA# 97-3149 Arrival Temperature 2.9 On ice? yes

Color tan Odor earthy Solids none

pH 6.47 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 17.8°C

Salinity (ppt) 1 TRC (mg/L) — Method —



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-349

NPDES#: N/A CLIENT: Oceana - Opa OUTFALL: B-2
ORGANISM SOURCE: ABS JRA BATCH#: C705 HATCH DATE: 3/17/97

Conc. % % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (≥ 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0		A	10	10	10	770	8.28	8.19	7.9	7.5	7.5	19.7	19.3	19.5	20	20
100		B	10	10	10											
6.25		A	10	10	10	749	8.24	8.13	8.2	6.9	7.0	19.8	19.3	19.5	20	20
100		B	10	10	10											
12.5		A	10	10	10	732	8.26	8.14	8.1	6.9	7.1	19.8	19.3	19.5	20	20
100		B	10	10	10											
25		A	10	10	10	721	8.24	8.14	8.1	7.0	7.0	19.8	19.3	19.5	20	20
100		B	10	10	10											
50		A	10	10	10	702	8.18	8.10	8.3	7.0	6.7	19.9	19.3	19.5	20	20
100		B	10	10	10											
100		A	10	10	9	689	8.07	8.11	8.9	7.0	7.3	19.8	19.3	19.5	20	20
95		B	10	10	10											

INIT	083	083	083	083
DATE 19 97	3/20	3/21	3/22	
TIME	1550	1725	1543	

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



JRA# 97-3149

OBSERVATIONS

acute *Mysidopsis bahia* Toxicity Test

TEST# N/A CLIENT: Ocean - ODU OUTFALL: 6-2
ORGANISM SOURCE: Chesapeake Culture JRA BATCH#: M453 HATCH DATE: 3/18-20/97 1500-0800

Conc. (%) % Surv.		REP #	NUMBER OF LIVE ORGANISMS (Control \geq 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0 , <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
HOURS			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100	B		10	10	10											
6.25	A		10	10	10	7.49	8.30	8.27	8.0	7.8	8.4	19.8	20.4	20.5	20	20
100	B		10	10	10											
12.5	A		10	10	10	7.32	8.30	8.26	8.1	7.7	8.4	19.8	20.4	20.5	20	20
100	B		10	10	10											
25	A		10	10	10	7.21	8.28	8.25	8.1	7.7	8.2	19.8	20.4	20.5	20	20
100	B		10	10	10											
50	A		10	10	10	7.02	8.21	8.21	8.3	7.6	7.6	19.9	20.4	20.5	20	20
100	B		10	10	10											
100	A		10	10	10	6.89	8.10	8.17	8.9	7.8	8.6	19.8	20.4	20.5	20	20
100	B		10	10	10											

INIT	106	103	106
DATE 1997	3/20	3/21	3/22
TIME	1600	1707	1605

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. Variegatus* "

GENERAL COMMENTS

JRA# 97-3149

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: B-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/24/97	0	3/19/97 2000	3/24/97	19.8	6.89	/	8.9	/	1	20	-	-

DO Adj. _____ pH Adj. _____ TRC Adj. _____ Feedings (*Mysid*)

Date _____ Date _____ Date _____ Date 3/20 3/21 3/21 3/22
 Method _____ Method _____ Method _____ Time 1630 1205 1730 1020
 Minutes _____ Amount _____ Amount _____ Init LOG LOG DS3 LOG

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/24/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
					TREATMENT PREPARATION CALCULATIONS	DS3		DS3
Control	1000	100	0	200 to 1000	NUMBER OF ORGANISMS	DS3		
6.25	1	1	62.5	1	STATISTICAL ANALYSES	N/A		
12.5	1	1	125	1				
25	1	1	250	1				
50	1	1	500	1				
100	1	1	1000	0				
CALCULATIONS PERFORMED BY: DS3								

TEST CHAMBER SIZE: 250 mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200 mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 DS3 26 DS3
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature DS3 VWR digi-thermo DS3 745 GC1 n/3
 Chlorine Fischer & Porter 821A0091J23 8811A940230-1 A

COMMENTS: _____



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 671

Sample ID: B-3

JRA ID: 97-3155

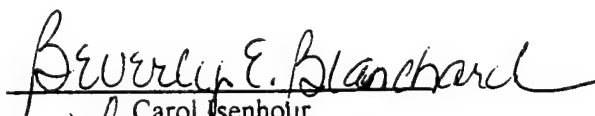
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Jensenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3155

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>16:09</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.88 - 8.11</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3155 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.7</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3155 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3155

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:45</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.88 - 8.19</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3155 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 8.7</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3155 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	<u>Corning</u>	<u>245</u>	<u>5147</u>	<u>G</u>
DO meter	<u>YSI</u>	<u>54ARC</u>	<u>14522</u>	<u>N</u>
SCT meter	<u>YSI</u>	<u>33</u>	<u>4458</u>	<u>A</u>
Temperature	<u>VWR</u>	<u>digi-thermo</u>	<u>7A5 QC1</u>	<u>N/A</u>
Chlorine	<u>Fischer</u>			
	<u>& Porter</u>	<u>821A009423</u>	<u>8811A940230-1</u>	<u>A</u>

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241
County Pipe/Outfall/Location
NPDES# Instream Waste Conc
Sample collected by (print&sign) yang Affiliation
Type of sample ☒ (Grab): Date 3/19/97 Time 2:00PM
 (Composite): From Date Time
To Date Time

Subsamples comprising composite:

Number B-3, 8Hr. Frequency of collection Volume 2L.
Temperature of sample in sample collection device 28.5°C
Final temperature of effluent at sample collection point
Is sample collection device chilled? Is sample packed on ice for shipment?
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)
Is the sample chlorinated? No dechlorinated? If so, how?
Permit with interim chlorine limit? No If yes - limit (mg/L)
Field pH 7.44 Field Total Residual Chlorine
Comments/Sample description B-3, 8Hr.

Type of test(s) to be performed ACUTE TOXICITY TESTING
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP
Method of shipment Reel

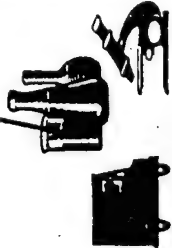
Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 2:00 PM
Received by D. Taylor & K. K. Date 3-20-97 Time
2. Relinquished by D. Taylor & K. K. Date 3-20-97 Time 12:20
Received by A. Taylor Date 3/20/97 Time 1245

FOR REED LAB USE-ONLY

JRA# 97-3155 Arrival Temperature 2.9 On ice? yes
Color tan Odor earthy Solids none
pH 6.49 DO (mg/L) 8.8 Conductivity (umhos/cm) 1800 @ 19.8°C
Salinity (ppt) 1 TRC (mg/L) — Method

CHAIN-OF-CUSTODY RECORD



& ANALYSIS REQUEST FORM
PWC ENVIRONMENTAL LABORATORY
 CODE 930 BLDG Z-140
 9742 MARYLAND AVENUE
 NORFOLK, VA 23511 - 3095
 PH: (757)445-8851 FAX: (757)445-8852

CLIENT INFORMATION

COMPANY/COMMAND: NAS OCEANA CODE:
 CONTACT: KIRK, DOUGLAS
 PHONE: EXT: FAX:
 J.O. #: 1912290
 SIGNATURE: 6V FUG
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN START STOP	ON DATE	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
										pH	TEMPERATURE	OTHER
664	B-1, 8 HL ODU	START 3/14/20-0 STOP	3/14/20-0	6	Yang	L	8	1	BIOASSAY		97-3148	
665	B-2, 8 HL ODU	START 20-00 STOP	20-00								97-3149	
666	MIX L. FL ODU	START 20-00 STOP	20-00								97-3150	
667	A-3 8 HL ODU	START 20-00 STOP	20-00								97-3151	
668	ODU - A-28 HL	START 20-00 STOP	20-00								97-3152	
669	FEEDS. ODU	START 3/14/20-0 STOP	3/14/20-0								97-3153	
670	A-1, 8 HL ODU	START 3/14/20-0 STOP	3/14/20-0								97-3154	

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	B - BAG	1 - COOL TO 4 C
CF - COMPOSITE FLOW	S - SOLID	G - GLASS	2 - HNO ₃ PH<2
CT - COMPOSITE TIME	GS - GAS	C - CARTRIDGE	3 - H ₂ SO ₄ PH<2
	SS - SEMI SOLID	T - TEFLON	4 - NaOH PH=12
		TE - TEFLON LINED LID	5 - HCL PH<2
		HE - HEXANE RINSED	6 - 0.008% Na ₂ S ₂ O ₃ 4 C
			7 - FIELD FILTER
			8 - NONE

TURNAROUND (Days): _____ (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

REGULATION APPLIED:

RCRA () HRSD ()
 SDWA () TSCA ()
 CWA () PHOTO ()
 CAA () OTHER ()

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB
Arrival Temp. 3.2°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *

*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY				SAMPLES VERIFICATION			
HOLDING TIME ()	CONTAINERS ()	INITIAL	REJECTED ()	REASON	INITIAL	DATE/TIME	DATE/TIME
RELINQUISHED BY: <u>Q. O'Connell</u>	REC'D BY: <u>Q. O'Connell</u>	COMPANY/COMMAND: <u>PAW, (M)</u>	DATE/TIME: <u>3/20/20 134</u>				
RELINQUISHED BY: <u>Q. O'Connell</u>	REC'D BY: <u>Q. O'Connell</u>	COMPANY/COMMAND: <u>PAW, (M)</u>	DATE/TIME: <u>3/20/20 135</u>				
RELINQUISHED BY: <u>Q. O'Connell</u>	REC'D BY: <u>Q. O'Connell</u>	COMPANY/COMMAND: <u>PAW, (M)</u>	DATE/TIME: <u>3/20/20 135</u>				
RELINQUISHED BY: <u>Q. O'Connell</u>	REC'D BY: <u>Q. O'Connell</u>	COMPANY/COMMAND: <u>PAW, (M)</u>	DATE/TIME: <u>3/20/20 135</u>				

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

D.O. NUMBER:

CONTRACT LAB:

CONTRACT NO. (S):


OFFICIAL USE ONLY

INITIAL:

DATE:

CHAIN-OF-CUSTODY RECORD

CLIENT INFORMATION



PWC ENVIRONMENTAL LABORATORY
CODE 930 BLDG Z-140
9742 MARYLAND AVENUE
NORFOLK, VA 23511 - 3095
PH: (757)445-8851 FAX: (757)445-8852

COMPANY/COMMAND: NAS Oceana CODE: _____
CONTACT: Kirk POWELL
PHONE: _____ EXT: _____ FAX: _____
J.O. #: 912290
SIGNATURE: _____
PERMIT NO.: _____

[illegible]

TYPE	MATRIX	SWEEPER	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	1 - COOL TO 4°C
CF - COMPOSITE FLOW	S - SOLID	GL - GLASS	CA - AMBER (glass)	5 - HCL pH<2
CT - COMPOSITE TIME	GS - GAS	T - TEFLON	CR - CARTRIDGE	6 - HNO ₃ pH<3
	SS - SEMI SOLID	V - VOAC	TL - TEFLON LINED LID	7 - FIELD FILTER
			H - HEXANERINSED	8 - NaOH pH=12
				9 - NONE

TURNAROUND (DAY):	(FOR RUSH TURNAROUND STATE REASON BELOW)												
COMMENTS:													
<table border="1"> <tr> <th colspan="2">REGULATION APPLIED:</th> </tr> <tr> <td>RCRA ()</td> <td>HRSD ()</td> </tr> <tr> <td>SDWA ()</td> <td>TSCA ()</td> </tr> <tr> <td>CWA ()</td> <td>PHOTO ()</td> </tr> <tr> <td>CAA ()</td> <td>OTHER ()</td> </tr> </table>		REGULATION APPLIED:		RCRA ()	HRSD ()	SDWA ()	TSCA ()	CWA ()	PHOTO ()	CAA ()	OTHER ()		
REGULATION APPLIED:													
RCRA ()	HRSD ()												
SDWA ()	TSCA ()												
CWA ()	PHOTO ()												
CAA ()	OTHER ()												
<table border="1"> <tr> <td>SAMPLING/COLLECTION CHARGE:</td> <td>\$</td> </tr> <tr> <td>POSSIBLE SAMPLE HAZARDS:</td> <td></td> </tr> <tr> <td>COMMENTS:</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>		SAMPLING/COLLECTION CHARGE:	\$	POSSIBLE SAMPLE HAZARDS:		COMMENTS:							
SAMPLING/COLLECTION CHARGE:	\$												
POSSIBLE SAMPLE HAZARDS:													
COMMENTS:													

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 3,2°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO. (S):	
OFFICIAL USE ONLY	

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *
ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

FOR LAB USE ONLY () CHECK BOX INITIAL FOR LAB SAMPLES VERIFICATION			
HOLDING TIME ()	CONTAINERS ()	INITIAL:	REJECTED ()
REINQUISHED BY:	REC'D BY:	COMPANY/COMMAND:	DATE/TIME:
REINQUISHED BY: <i>J. Amador</i>	REC'D BY: <i>GR</i>	COMPANY/COMMAND: <i>PULC</i>	DATE/TIME: <i>3/20/7 12:50</i>
REINQUISHED BY: <i>GR</i>	REC'D BY: <i>Yulio S. SA</i>	COMPANY/COMMAND: <i>PAJ</i>	DATE/TIME: <i>3/20/7 12:5</i>
REINQUISHED BY:	REC'D BY:	COMPANY/COMMAND:	DATE/TIME:
REINQUISHED BY:	REC'D BY:	COMPANY/COMMAND:	DATE/TIME:



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-3155

NPDES#: N/A CLIENT: Oceanic - Opa OUTFALL: B-3
ORGANISM SOURCE: ABS JRA BATCH#: C205 HATCH DATE: 3/17/97

Conc. % % Surv.	HOURS	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	0	A	10	10	10	7.70	8.28	8.19	7.9	7.5	7.5	19.7	19.3	19.5	20	20
100	0	B	10	10	10	7.48	8.05	8.27	8.0	7.2	7.5	19.8	19.3	19.5	20	20
6.25	0	A	10	10	10	7.32	8.02	8.27	8.1	7.1	7.5	19.8	19.3	19.5	20	20
90	0	B	10	10	10	7.21	8.03	8.23	8.1	7.0	7.6	19.9	19.3	19.5	20	20
12.5	0	A	10	10	10	7.08	8.01	8.20	8.2	7.0	7.6	19.9	19.3	19.5	20	20
45	0	B	10	10	10	6.88	8.08	8.10	8.7	5.9	7.7	19.8	19.3	19.5	20	20
25	0	A	10	10	10											
100	0	B	10	10	10											
50	0	A	10	10	10											
100	0	B	10	10	10											
95	0	A	10	10	10											
	0	B	10	10	10											

* pH probe malfunctioning - replaced

INIT	053	057	046
DATE 19 97	3/20	057	3/21 3/22
TIME	1550	1729	1717 1545

(Indicate comments with an * and document on General Comments page)



JRA# 97-3155

OBSERVATIONS

cute *Mysidopsis bahia* Toxicity Test

IPDES#: N/A CLIENT: Ocean - OJA

OUTFALL: B.3

ORGANISM SOURCE: Chesapeake Cultured

JRA BATCH#: M453

HATCH DATE: 3/15/97 1500-0800

ORGANISM SOURCE: <u>C. VESICULOSUS</u>		REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
Conc (%)	% Surv.			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0		A		10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100		B		10	10	10											
6.25		A		10	10	10	7.48	8.26	8.10	8.0	7.2	7.0	19.8	20.4	20.5	20	20
100		B		10	10	10											
12.5		A		10	9	9	7.32	8.24	8.10	8.1	6.9	7.0	19.8	20.4	20.5	20	20
90		B		10	10	9											
25		A		10	9	9	7.21	8.21	8.08	8.1	6.9	6.9	19.9	20.4	20.5	20	20
90		B		10	10	9											
50		A		10	9	9	7.08	8.18	8.11	8.2	7.0	7.0	19.9	20.4	20.5	20	20
80		B		10	9	7											
100		A		10	10	9	6.88	8.10	8.11	8.7	7.1	7.2	19.8	20.4	20.5	20	20
90		B		10	9	9											
										</							

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

NPDES#: N/A CLIENT: Oceana OilOUTFALL: B.3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.8	6.88	/	8.7	/	1	20	—	—

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22
 Method 1630 Method 1205 Method 1730 Method 1020
 Minutes LOC Amount LOC Amount ND Amount LOC

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/29/97	19.7	7.70	7.90	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>BS</u>
Control	1000	100	0	P1472 To 1000	NUMBER OF ORGANISMS	<u>BS</u>		
6.25			62.5		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250 mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>26</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digit-thermo	<u>745 DC1</u>	N/A
Chlorine	Fischer & Porter	821A0091/23	8811A940230-1	A

COMMENTS:



March 31, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 669

Sample ID: Feed S.

JRA ID: 97-3153

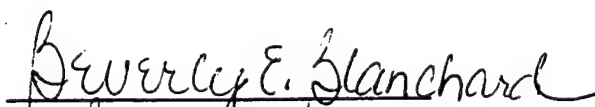
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3153

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/20/97 Time 16:00

Test End: 3/22/97 15:49

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): All vessels from test initiation

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.73</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3153 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.2 - 8.8</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: Spearman-Karber
Growth/Reproduction: N/A

JRA #: 97-3153 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>19.5%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3153

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>15:50</u>
Test End:	<u>3/22/97</u>	<u>15:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>3 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>All vessels from test initiation</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>6.73 - 8.34</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3153 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>2.1 - 8.8</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: Spearman-Karber
Growth/Reproduction: N/A

JRA #: 97-3153 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>35%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		
3/20/97	19.5	35		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241

County Pipe/Outfall/Location
NPDES# Instream Waste Conc

Sample collected by (print&sign) Yang Affiliation

Type of sample ✓ (Grab): Date 3/19/97 Time 20:00 PM

 (Composite): From Date Time

To Date Time

Subsamples comprising composite:

Number Feed S Frequency of collection Volume 2 L

Temperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point

Is sample collection device chilled? Is sample packed on ice for shipment?

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? If so, how?

Permit with interim chlorine limit? No If yes - limit (mg/L)

Field pH 6.7 Field Total Residual Chlorine

Comments/Sample description Feed S

Type of test(s) to be performed ACUTE TOXICITY TESTING
(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reel

Print & Sign Names

1.	Relinquished by <u>Yang</u>	Date <u>03/19/97</u>	Time <u>12:00 PM</u>
	Received by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>Noon</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>3-20-97</u>	Time <u>12:20</u>
	Received by <u>[Signature]</u>	Date <u>3/20/97</u>	Time <u>12:45</u>

FOR REED LAB USE ONLY

JRA# 97-3153 Arrival Temperature 2.9 On ice? yes
Color tan Odor yes Solids none
pH 6.55 DO (mg/L) 8.9 Conductivity (µmhos/cm) 1600 @ 19.3 °C
Salinity (ppt) 1 TRC (mg/L) — Method —



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-313

NPDES#: N/A CLIENT: Ocean - Opa OUTFALL: Feed S
ORGANISM SOURCE: ABS JRA BATCH#: C205 HATCH DATE: 3/17/97

Conc %	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	770	828	815	7.9	7.5	7.5	19.7	19.3	19.5	20	20
100	B		10	10	10											
6.25	A		10	10	10	768	798	826	8.0	6.8	8.0	19.7	19.3	19.5	20	20
100	B		10	10	10											
12.5	A		10	10	10	759	508	829	8.0	7.5	8.2	19.6	19.3	19.5	20	20
100	B		10	10	10											
25	A		10	10	9	742	498	808	8.1	7.1	5.8	19.6	19.3	19.5	20	20
95	B		10	10	10											
50	A		10	10	10	710	478	808	8.3	6.6	5.9	19.5	19.3	19.5	20	20
5	B		10	10	10											
100	A		10	10	10	673	488	831	8.8	2.1	6.7	19.3	19.3	19.5	20	20
0	B		10	9	10											

* pH probe malfunctioning - replaced

INIT	103	106	106
DATE 19 97	3/20	3/21	3/22
TIME	1550	1610	1530

(Indicate comments with an * and document on General Comments page)

LC50=35%

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/20/97

TEST NUMBER: 97-3153

DURATION: 48 hours

TOXICANT : Feed S.

SPECIES: C. variegatus

RAW DATA:	Concentration	Number	Mortalities
--- ----	(%)	Exposed	
	.00	20	0
	6.25	20	0
	12.50	20	0
	25.00	20	1
	50.00	20	19
	100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES:	LC50:	35.36
	95% LOWER CONFIDENCE:	32.13
	95% UPPER CONFIDENCE:	38.90



ute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-3153

PDES#: N/A CLIENT: Ocean - OOI OUTFALL: Feed S
ORGANISM SOURCE: Chesapeake Cultures JRA BATCH#: M453 HATCH DATE: 3/19/97 1500-0800

C Conc (%) % Surv.	REP ↓	HOURS ⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	7.70	8.27	8.30	7.9	7.0	8.5	19.7	20.4	20.5	20	20
100	B	0	10	10	10											
6.25	A	0	10	9	9	7.68	5.12	8.10	8.0	7.1	8.1	19.7	20.4	20.5	20	20
40	B	0	10	10	9											
12.5	A	0	10	9	8	7.59	5.08	8.26	8.0	7.2	7.9	19.6	20.4	20.5	20	20
80	B	0	10	9	8											
25	A	0	10	9	7	7.42	5.17	8.30	8.1	7.4	7.9	19.6	20.4	20.5	20	20
35	B	0	10	9	7											
50	A	0	10	0	0	7.10	4.79	-	8.3	0.4	-	19.5	20.4	20.8	20	20
0	B	0	10	0	0											
100	A	0	10	0	0	6.73	4.84	-	8.8	0.2	-	19.3	20.4	20.8	20	20
0	B	0	10	0	0											

* pH probe malfunctioning - replaced

INIT	7/20	7/21	7/22
DATE 1997	LOG	LOG	LOG
TIME	1600	1555	1549

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 19.5%

DATE: 3/20/97
 TOXICANT : Feed S.
 SPECIES: M. bahia

TEST NUMBER: 97-3153

DURATION: 48 hours

RAW DATA: Concentration ----- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	2
12.50	20	4
25.00	20	13
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: 10.00%

SPEARMAN-KARBER ESTIMATES: LC50: 19.52
 95% LOWER CONFIDENCE: 15.31
 95% UPPER CONFIDENCE: 24.88

Acute *Mysidopsis bahia* Toxicity Test" *C. Variegatus* "

GENERAL COMMENTS

JRA# 97-3153

NPDES#: N/A CLIENT: Oceana ODUOUTFALL: Feels

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/29/97	0	3/19/97 2000	3/29/97	19.3	6.73	✓	8.8	✓	1	20	-	-

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

1997
 Date 3/20 3/21 3/21 3/22
 Method 1630 1205 1730 1020
 Minutes Amount Amount Init 106 106 100 106

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/29/97	0	3/29/97	19.7	7.70	7.9	20	40.21

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	0 to 1000	NUMBER OF ORGANISMS	BS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	BS		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250 mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Coming	245	5147	BS 26
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	BS VWR	diel-thermo	BS 7AS GC1	N/A

Chlorine Fischer & Porter 821A009U23 3811A940230-1
 COMMENTS: maintain pump shut off over night for 25% rep. A.

March 31, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-083

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AC

NPDES Permit #: N/A

PWC #: 666

Sample ID: Mix L. R.R.

JRA ID: 97-3150

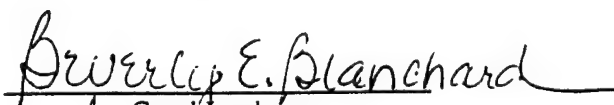
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3150

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/20/97</u>	Time <u>16:00</u>
Test End:	<u>3/22/97</u>	<u>15:52</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.27 - 8.22</u>	<u>7.70 - 8.30</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3150 Test Type&Organism: Acute Mysisidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 9.0</u>	<u>7.0 - 8.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3150 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3150

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/20/97 Time 15:50

Test End: 3/22/97 15:32

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 3 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>7.27 - 8.16</u>	<u>7.70 - 8.28</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3150 Test Type&Organism: Acute (*Cyprinodon variegatus*)

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>7.5 - 7.9</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3150 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/24/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address CIVIL & ENV. TAL. ENG. DEPT.
KDH 135 NORFOLK VA 23529-0241

County ✓ Pipe/Outfall/Location ✓
NPDES# ✓ Instream Waste Conc ✓

Sample collected by (print & sign) yang Affiliation ✓

Type of sample ✓ (Grab): Date 3/19/97 Time 20:00 PM

(Composite): From Date ✓ Time ✓

To Date ✓ Time ✓

Subsamples comprising composite:

Number Mix L. RR Frequency of collection ✓ Volume 2L

Temperature of sample in sample collection device 23.0°C

Final temperature of effluent at sample collection point ✓

Is sample collection device chilled? ✓ Is sample packed on ice for shipment? ✓

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? ✓ If so, how? ✓

Permit with interim chlorine limit? No If yes - limit (mg/L) ✓

Field pH 7.51 Field Total Residual Chlorine ✓

Comments/Sample description Mix L. RR

Type of test(s) to be performed ACUTE TOXICITY TESTING

(Specify organisms) CYPRINODON VARIEGATUS & MYSID SHRIMP

Method of shipment Reed

Print & Sign Names

1. Relinquished by yang Date 03/19/97 Time 20:12 PM

Received by D. Taylor & K. Kish Date 3-20-97 Time Noon

2. Relinquished by D. Taylor & K. Kish Date 3-20-97 Time 12:20

Received by A. Angeles Date 3/22/97 Time 1245

Re PWC CAC

FOR REED LAB USE ONLY

JRA# 97-3150 Arrival Temperature 29 On ice? ✓

Color tan Odor earthy Solids none

pH 6.94 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1900 @ 19.7°C

Salinity (ppt) 1 TRC (mg/L) ✓ Method ✓

#Siddn
N/A

CLIENT: Decora - Odu

OUTFALL: Mix L

ORGANISM SOURCE: APBS

JIRA BATCH#: C205

HATCH DATE: 3/7/97

[illegible]



ate *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-350

PD# N/A CLIENT: Ocean - Oda OUTFALL: MxL
ORGANISM SOURCE: Chesapeake Cultures IRA BATCH#: 1453 HATCH DATE: 3/19/97 1500-0800

Cone (%) % Surv.	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
		0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	10	10	10	770	827	830	7.9	7.0	6.5	19.7	20.4	20.5	20	20
100	B	10	10	10											
6.25	A	10	10	10	768	823	830	8.0	7.2	6.6	19.8	20.4	20.5	20	20
100	B	10	10	10											
12.5	A	10	10	10	762	824	831	8.1	7.1	6.6	19.8	20.4	20.5	20	20
100	B	10	10	10											
25	A	10	10	10	751	823	831	8.2	7.0	6.6	19.8	20.4	20.5	20	20
100	B	10	10	10											
50	A	10	10	10	743	821	824	8.4	7.0	6.6	19.9	20.4	20.5	20	20
100	B	10	10	10											
100	A	10	10	10	727	811	822	9.0	7.4	6.4	19.7	20.4	20.5	21	21
100	B	10	10	10											

INIT	106	183	106
DATE 1997	3/20	3/21	3/22
TIME	1600	1653	1552

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

JRA# 97-3150

NPDES#: N/A CLIENT: Oceana OduOUTFALL: Mix L

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/20/97	0	3/19/97 2000	3/20/97	19.7	7.27	✓	9.0	✓	1	21	—	—

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/20 Date 3/21 Date 3/21 Date 3/22
 Method 1630 Method 1205 Method 1730 Method 1020
 Minutes 106 Amount 106 Amount 153 Amount 106

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/20/97	0	3/20/97	19.7	7.70	7.9	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	214.72 To 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

VERIFICATION OF:

VERIFIED BY:

ANALYST SIGNATURES

INITIALS

TREATMENT PREPARATION CALCULATIONS

NUMBER OF ORGANISMS

STATISTICAL ANALYSES

CALCULATIONS PERFORMED BY: BSTEST CHAMBER SIZE: 250 mLTYPE: PolystyreneVOLUME OF TEST SOLUTION: 200 mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digit-thermo	<u>745 QC1</u>	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

ACUTE TOXICITY TEST RESULTS

50 ppm AFFF

FEBRAURY 11, 1997

February 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 576

Sample ID: A-1

JRA ID: 97-1622

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlone
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-1622

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:35</u>
Test End:	<u>2/14/97</u>	<u>15:45</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.00 - 8.10</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1622 Test Type&Organism: Acute Mysisidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.0 - 8.3</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1622 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	<u>Corning</u>	<u>245</u>	<u>5147</u>	<u>E</u>
DO meter	<u>YSI</u>	<u>54ARC</u>	<u>14522</u>	<u>N</u>
SCT meter	<u>YSI</u>	<u>33</u>	<u>4458</u>	<u>A</u>
Temperature	<u>VWR</u>	<u>digi-thermo</u>	<u>7A5 QC1</u>	<u>N/A</u>
Chlorine	<u>Fischer</u>			
	<u>& Porter</u>	<u>821A009423</u>	<u>8811A940230-1</u>	<u>A</u>

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-1622

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:35</u>
Test End:	<u>2/14/97</u>	<u>16:52</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.10 - 8.13</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1622 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1622 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 2/18/97

Result (mg/L) 27

QC Range (mg/L) 0 thru 34

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

CLIENT INFORMATION

COMPANY/COMMAND: DEANNA NAGS CODE:

CONTACT: DOUGLAS KYLE

PHONE: 733 3439 EXT: FAX:

J.O.#: 1912240

SIGNATURE:

PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS			PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	TRACER	97-1617	4°C		
		STOP		PM										
572	B-2	START	2/1/97	0700							97-1618			
		STOP		PM										
573	B-1	START	2/1/97	0700							97-1619			
		STOP		PM										
574	A-3	START	2/1/97	0700							97-1620			
		STOP		PM										
575	A-2	START	2/1/97	0700							97-1621			
		STOP		PM										
576	A-1	START	2/1/97	0700							97-1622			
		STOP		PM										
577	MIXED	START	2/1/97	1100	G	HY	L	1	1		97-1623			
		STOP		PM										

TYPE	MATRIX	SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	A - AMBER (glass)
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE	1 - COOL TO 4 C
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID	2 - HNO3, pH<2
	SS - SEMI SOLID	V - VOA	H - HEXANE RINSED	3 - H2SO4, pH<2
				4 - NaOH, pH>12
				5 - HCL, pH<2
				6 - 0.008% Na2S2O3, 4 C
				7 - FIELD FILTER
				8 - NONE

TURNAROUND (Days): (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

REGULATION APPLIED:

RCRA () HRSD ()

SDWA () TSCA ()

CWA () PHOTO ()

CAA () OTHER ()

Arrival Temp. 26°C

D.O. NUMBER: 227 INIT.:

CONTRACT LAB: DATE:

CONTRACT NO.(S):

OFFICIAL USE ONLY

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). * ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

HOLDING TIME ()	CONTAINERS ()	INITIAL	REASON	REJECTED ()
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	INITIAL: <u> </u>
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	INITIAL: <u> </u>
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	INITIAL: <u> </u>
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	INITIAL: <u> </u>

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

P.O.C.: Douglas Kirk
COMMAND: Orange NAS

[illegible]

COMMENTS:

Arrival Temp. 2.0°C

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO.(S):	
OFFICIAL USE ONLY	

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY 17:00 AM -- 3:30 PM

**FOR LAB USE ONLY!!		CHECK BOX & INITIAL IF OKAY		SAMPLES VERIFICATION		DATE TIME	
HOLDING TIME ()	CONTAINERS ()	INITIAL	REJECTED ()	REASON:	INITIAL	DATE/TIME	DATE/TIME
		REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND: <i>[Signature]</i>			DATE/TIME: <i>2/12/87</i>	DATE/TIME: <i>2/12/87</i>
		REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND: <i>[Signature]</i>			DATE/TIME: <i>2/12/87</i>	DATE/TIME: <i>2/12/87</i>
		REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND: <i>[Signature]</i>			DATE/TIME: <i>2/12/87</i>	DATE/TIME: <i>2/12/87</i>
		REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND: <i>[Signature]</i>			DATE/TIME: <i>2/12/87</i>	DATE/TIME: <i>2/12/87</i>

#576

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____

NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 1:00 AM 2:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number A-1 2H Frequency of collection _____ Volume 2L

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point 22.0°C

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.40 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment by air

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kath Cifal</u>	Date <u>2-12-97</u>	Time <u>10:00 A.M.</u>
2.	Relinquished by <u>Kath Cifal</u>	Date <u>2-12-97</u>	Time <u>10:15 A.M.</u>
	Received by <u>Shelly</u>	Date <u>2-12-97</u>	Time <u>10:15 AM.</u>
	Relng. by <u>R. Hameel</u>	<u>2-12-97</u>	<u>1405</u>
	<u>12/67</u>	<u>2/12/97</u>	<u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1622 Arrival Temperature 2.0°C On ice? yes

Color tan Odor earthy Solids none

pH 7.74 DO (mg/L) 7.8 Conductivity (µmhos/cm) 1800 @ 19.9 °C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



JRA# 97-1622

OBSERVATIONS

Acute *Oryzias latipes* Toxicity TestNPDES#: PLA CLIENT: Oreana OUTFALL: 6 A-1
ORGANISM SOURCE: ABS JRA BATCH#: C02 HATCH DATE: 2/6/97

Conc. %		REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
% Surv.	HOURS⇒		0	24	48	0	24	48	0	24	48	0	24	48	0	END
0		A	10	10	10	8.66	8.42	8.30	7.5	7.7	8.4	20.3	19.5	20.6	20	20
6.25		A	10	10	10	8.61	8.38	8.19	7.7	7.5	7.5	20.4	19.5	20.6	20	20
12.5		A	10	10	10	8.52	8.40	8.24	7.8	7.4	7.2	20.4	19.5	20.6	20	20
25		A	10	10	10	8.44	8.35	8.21	8.0	7.2	6.8	20.3	19.5	20.6	20	20
50		A	10	10	10	8.32	8.26	8.19	8.1	7.1	7.0	20.2	19.5	20.6	20	20
100		A	10	10	10	8.10	8.10	8.13	8.3	7.1	7.1	19.9	19.5	20.6	20	20
100		B	10	10	10											



Site Mysidopsis bahia Toxicity Test

OBSERVATIONS

JRA# 97-1622

PDESH# N/A CLIENT: Ocean ODU OUTFALL: 6 A-1
ORGANISM SOURCE: ABS JRA BATCH#: 1442 HATCH DATE: 2/8/97

TIME (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	8.66	8.31	8.03	7.5	6.4	6.5	20.3	20	20.6	20	20
6.25	A	0	10	10	10	8.61	8.27	7.90	2.7	6.3	4.9	20.4	20	20.6	20	20
12.5	A	0	10	10	10	8.52	8.28	7.95	7.8	6.0	4.1	20.4	20	20.6	20	20
18.75	A	0	10	10	10	8.44	8.27	8.04	8.0	5.8	4.8	20.3	20	20.6	20	20
25	A	0	10	10	10	8.32	8.20	8.09	8.1	6.0	5.1	20.2	20	20.6	20	20
31.25	A	0	10	10	10	8.10	8.01	8.00	8.3	5.9	5.0	19.9	20	20.6	20	20
37.5	A	0	10	10	10											
43.75	A	0	10	10	10											
50	A	0	10	10	10											
56.25	A	0	10	10	10											
62.5	A	0	10	10	10											
68.75	A	0	10	10	10											
75	A	0	10	10	10											
81.25	A	0	10	10	10											
87.5	A	0	10	10	10											
93.75	A	0	10	10	10											
100	A	0	10	10	10											
INIT			0.3	100	100											
DATE 1997			2/12	2/13	2/14											
TIME			1635	1548	1445											

1545

(Indicate comments with an * and document on General Comments page)

NPDES#: N/A CLIENT: Oceana EDU OUTFALL: 6 A-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.9	8.0	✓	8.3	✓	1	20	✓	✓

DO Adj. pH Adj. TRC Adj. Feedings (*Mysid*)

1997

Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14 _____
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0859 _____
 Minutes _____ Amount _____ Amount _____ Init LOG LOG LOG LOG _____

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC. (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			OS
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	OS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: <u>OS</u>								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>Baxton VWR</u>	digj-thermo	<u>745 QCI</u>	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 575

Sample ID: A-2

JRA ID: 97-1621

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Clanton
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-1621

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:30</u>
Test End:	<u>2/14/97</u>	<u>15:42</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	:
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.01 - 8.14</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1621 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>4.7 - 8.2</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1621 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 2/11/97
Result (mg/L) 0.15
QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-1621

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:30</u>
Test End:	<u>2/14/97</u>	<u>16:45</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.12 - 8.15</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1621 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-1621 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD



& ANALYSIS REQUEST FORM
PWC ENVIRONMENTAL LABORATORY
 CODE 930 BLDG Z-140
 9742 MARYLAND AVENUE
 NORFOLK, VA 23511 - 3095
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

CLIENT INFORMATION

COMPANY/COMMAND: DELEAND, N A S CODE:
 CONTACT: DOUGLAS K MC
 PHONE: 733-3439 EXT: FAX:
 J.O. #: 1912290
 SIGNATURE:
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START STOP	2/16/97 0700 PM		G	HY	L	1	1	TRACILLES MO/6V		97-1617	4°C
572	B-2	START STOP	2/16/97 0700 PM									97-1618	
573	B-1	START STOP	2/16/97 0700 PM									97-1619	
574	A-3	START STOP	2/16/97 0700 PM									97-1620	
575	A-2	START STOP	2/16/97 0700 PM									97-1621	
576	A-1	START STOP	2/16/97 0700 PM									97-1622	
577	MIXED L & R	START STOP	2/16/97 1100 AM		G	HY	L	1	1			97-1623	

TYPE	MATRIX	L-LIQUID S-SOLID GS-GAS SS-SEMI SOLID	SW-SWIPE	CONTAINER	PRESERVATIVE
G-GRAB				P-PLASTIC GL-GLASS T-TEFLON V-VOA	1-COOL TO 4 C 2-HNO3, pH<2 3-H2SO4, pH<2 4-NaOH, pH>12 5-HCL, pH<2 6-0.008% Na2S2O3, 4 C 7-FIELD FILTER 8-NONE

TURNAROUND (Days): (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

REGULATION APPLIED:
 RCRA () HRSD ()
 SDWA () TSCA ()
 CWA () PHOTO ()
 CAA () OTHER ()

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 2.6°C AS/2

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
 *ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

D.O. NUMBER: 227/067 INIT.:

CONTRACT LAB: DATE:

CONTRACT NO.(S):

OFFICIAL USE ONLY

FOR LAB USE ONLY:

CHECK BOX & INITIAL IF OKAY:

SAMPLES VERIFICATION:

REINQUIRED BY: RECD BY: INITIAL:

REINQUIRED BY: RECD BY: DATE/TIME: 2/16/97 1330

REINQUIRED BY: RECD BY: DATE/TIME: 2/12/97 1405

REINQUIRED BY: RECD BY: DATE/TIME:

CONTINUATION SHEET

SHEET

OF

—

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

POC:

COMMAND: O.F. - ALAC

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO.(S):	
OFFICIAL USE ONLY	

Arrival Temp. 20°C

COMMENTS: 1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

•• FOR LAB USE ONLY!!		CHECK BOX & INITIAL IF OKAY		SAMPLES VERIFICATION	
HOLDING TIME ()	CONTAINERS ()	INITIAL:	REJECTED ()	REASON:	INITIAL:
RELINQUISHED BY: <i>Stacy Goodell</i>	REC'D BY: <i>Stacy Goodell</i>		COMPANY/COMMAND: <i>Stacy</i>		DATE/TIME: <i>2/12/96 133</i>
RELINQUISHED BY: <i>Stacy Goodell</i>	REC'D BY: <i>Stacy Goodell</i>		COMPANY/COMMAND: <i>Stacy</i>		DATE/TIME: <i>2/12/97 1405</i>
RELINQUISHED BY:	REC'D BY:		COMPANY/COMMAND:		DATE/TIME:
RELINQUISHED BY:	REC'D BY:		COMPANY/COMMAND:		DATE/TIME:

#575

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____

NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number A-2 8 Hr. Frequency of collection _____ Volume _____

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By side

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kith C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00 AM</u>
2.	Relinquished by <u>Kith C. [Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Received by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1621 Arrival Temperature 2.0°C On ice? YES

Color tan Odor earthy Solids none

pH 7.71 DO (mg/L) 7.7 Conductivity (µmhos/cm) 1800 @ 19.9°C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



OBSERVATIONS

Blue *Cyprinodon variegatus* Toxicity Test

2/18

CLIENT: Deanna

CDL

OUTFALL: 5 A-2

ORGANISM SOURCE: AgS

JURA BATCH#: C202

MATCH DATE: 2/6/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



OBSERVATIONS

JRA# 97-1621

PLA

CLIENT: Diana QDU

OUTFALL: 5 A-2

ORGANISM SOURCE: ABS

JRA BATCH#: 1/442

IIATCH DATE: 2/8/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96


 NPDES#: N/A CLIENT: Ocean ODU OUTFALL: 5 A2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.9	8.14	/	8.2	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

1997

 Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14 _____
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0859 _____
 Minutes _____ Amount _____ Amount _____ Init LDC LDC LDC LDC _____

 DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25			62.5	
12.5			125	
25			250	
50			500	
100			1000	0

CALCULATIONS PERFORMED BY: 083

VERIFICATION OF:

VERIFIED BY:

TREATMENT PREPARATION CALCULATIONS

NUMBER OF ORGANISMS

STATISTICAL ANALYSES

083

083

N/A

ANALYST SIGNATURES

INITIALS

083

 TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 083 26
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature 083 Baxter VWR diei-thermo 083 7AS QCI N/A
 Chlorine Fischer & Porter 821A009U3 8811A940230-1 A
 COMMENTS: _____



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 574

Sample ID: A-3

JRA ID: 97-1620

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Carol Isenhour
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-1620

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:25</u>
Test End:	<u>2/14/97</u>	<u>15:40</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>8.03 - 8.10</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1620 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>4.6 - 8.2</u>	<u>6.4 - 7.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1620 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-1620

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:25</u>
Test End:	<u>2/14/97</u>	<u>16:22</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>21</u>	
3. <u>pH</u>		
Initial	<u>8.10 - 8.18</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1620 Test Type&Organism: Acute Cyprinodon variegatus

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1620 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

CLIENT INFORMATION

COMPANY/COMMAND: OCEANNA N/AS CODE:

CONTACT: Douglas KYLE

PHONE: 433-3439 EXT: FAX:

J.O. #: 1912290

SIGNATURE:

PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN START STOP	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1	TOXICITY MOB/PC	97-1617	97-1618	4°C
572	B-2	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1		97-1618	97-1619	
573	B-1	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1		97-1620	97-1621	
574	A-3	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1		97-1622	97-1623	
575	A-2	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1				
576	A-1	START 12/1/97 0700 STOP 12/1/97 0700	12/1/97	0700	G	HY	L	1	1				
577	MIXED L & R	START 12/1/97 1100 STOP 12/1/97 1100	12/1/97	1100	G	HY	L	1	1				

TYPE	MATRIX	CONTAINER	PRESERVATIVE	1 - COOL TO 4°C	2 - HNO ₃ pH<2	3 - H ₂ SO ₄ pH<2	4 - NaOH pH>12	5 - HCL pH<2	6 - 0.008% Na ₂ S ₂ O ₃	7 - FIELD FILTER	8 - NONE
G - GRAB	L - LIQUID	P - PLASTIC	A - AMBER (glass)								
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE								
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID								
	SS - SEMI SOLID	V - VOA	H - HEXANE RINSED								

TURNAROUND (DAYS): (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

REGULATION APPLIED:

RCRA () HRSD ()
SDWA () TSCA ()
CWA () PHOTO ()
CAA () OTHER ()

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 2.6°C

D.O. NUMBER: 227/067

CONTRACT LAB: DATE:

CONTRACT NO.(S):

OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).

*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

HOLDING TIME ()	CHECK BOX & INITIAL IF OKAY	CONTAINERS ()	INITIAL	REJECTED ()	REASON	DATE/TIME	INITIAL
RELINQUISHED BY: [Signature]					COMPANY/COMMAND: [Signature]	DATE/TIME: 12/1/97 1330	
RELINQUISHED BY: [Signature]					COMPANY/COMMAND: [Signature]	DATE/TIME: 12/1/97 1405	
RELINQUISHED BY: [Signature]					COMPANY/COMMAND: [Signature]	DATE/TIME: 12/1/97 1405	
RELINQUISHED BY: [Signature]					COMPANY/COMMAND: [Signature]	DATE/TIME: 12/1/97 1405	

CONTINUATION SHEET

SHEET

FO

9



PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

P.O.C.: Douglas Kirk
COMMAND: OCEANO NAS

[illegible]

COMMENTS:

Arrival

D.O. NUMBER:	INIT.:
--------------	--------

DATE: _____

CONTRACT LAB: _____

CONTRACT LAB:

NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NEEDED TO SHIP YOUR ORDER.
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

••FOR LAB USE ONLY!!

CHECK BOX & INITIAL IF OKAY:

HOLDING TIME ()

CONTAINERS ()

INITIAL:

REJECTED ()

REASON:

INITIAL:

RELINQUISHED BY:

RECEIVED BY: [Signature] DATE: [Blank] TIME: [Blank]

()

100

[illegible]

RELINQUISHED BY:

REC'D BY: 18

COMPANY/COMMAND:

655-59

2/12

RELINQUISHED BY:

REC'D BY: *[Signature]*

COMPANY/COMMAND:

102

21/2

RELINQUISHED BY:

REC'D BY: 7

COMPANY/COMMAND:

نفا

Toxicity Test Sample Chain of Custody
(Please complete all information)

#574



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____

NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 12:00 AM 7:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number A-3, B4 Frequency of collection _____ Volume _____

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point 22.0°C

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1. Relinquished by H. YANG Date 2/12/97 Time 9:00 AM

Received by Keith C. [Signature] Date 2-12-97 Time 10:00

2. Relinquished by Keith C. [Signature] Date 2-12-97 Time 10:15

Received by Keith C. [Signature] Date 2-12-97 Time 10:15

Relinquished by [Signature] Date 2-12-97 Time 1405

Relinquished by [Signature] Date 2/12/97 Time 1405

FOR REED LAB USE ONLY

JRA# 97-1620 Arrival Temperature 2.0C On ice? yes

Color tan Odor earthy Solids none

pH 7.72 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 17.7 °C

Salinity (ppt) 1 TRC (mg/L) NA Method NA



Acute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 77.162P

NPDES#: NA CLIENT: Oceana DOA
ORGANISM SOURCE: ABS JRA BATCH#: 1/142
OUTFALL: 4 A-3
HATCH DATE: 2/8/97

C _{conc} (%)	REP # Surv.	HOURS	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	8.66	8.31	8.03	7.5	6.4	6.5	20.3	20.0	20.6	20	20
6.25	A	0	10	10	10	8.64	8.27	7.86	7.6	6.6	5.0	20.4	20.0	20.6	20	20
12.5	A	0	10	10	10	8.59	8.28	7.98	7.7	6.2	4.0	20.3	20.0	20.6	20	20
140	B	0	10	10	10	8.42	8.27	8.01	7.9	6.0	3.7	20.3	20.0	20.6	20	20
25	A	0	10	10	10	8.30	8.22	8.08	8.0	5.9	4.3	20.0	20.0	20.6	20	20
100	B	0	10	10	10	8.10	8.09	8.03	8.2	6.3	4.6	17.7	20.0	20.6	21	21
50	A	0	10	10	10											
100	B	0	10	10	10											
100	A	0	10	10	10											
95	B	0	10	9	9											
INIT			95	406	100											
DATE 1997			2/12	2/13	2/14											
TIME			1600	1545	1540											

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96


 NPDES#: N/A CLIENT: Oceana ODU OUTFALL: 4 A-3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)


DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt) 19-21	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.7	8.10	/	8.2	/	1	21	/	/

 DO Adj. _____ pH Adj. _____ TRC Adj. _____ Feedings (mg/L) 1997

 Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14 _____
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0857 _____
 Minutes _____ Amount _____ Amount _____ Init LDG LDG LDG LDG _____

 DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			B3
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	B3		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: <u>B3</u>								

 TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 B3 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature Baxter VWR diei-thermo B3 745 DC1 N/A
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A
 COMMENTS: _____



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 573

Sample ID: B-1

JRA ID: 97-1619

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Chadwick
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-1619

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	<u>Date</u> <u>2/12/97</u>	<u>Time</u> <u>16:20</u>
Test End:	<u>2/14/97</u>	<u>15:35</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.97 - 8.03</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1619 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.1 - 8.2</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1619 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 2/11/97
Result (mg/L) 0.15
QC Range (mg/L) 0.04 thru 0.24

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-1619

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:20</u>
Test End:	<u>2/14/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.08</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1619 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-1619 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY
 CODE 930 BLDG Z-140
 9742 MARYLAND AVENUE
 NORFOLK, VA 23511 - 3095
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852



CLIENT INFORMATION

COMPANY/COMMAND: DELETTA, N. A. S. CODE:
 CONTACT: Donna Kirk
 PHONE: 733-3439 EXT: FAX:
 J.O. #: 191229C
 SIGNATURE:
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	3/1/97	0700	G	HY	L	1	1	70-1617	97-1617	4°C	PH
572	B-2	STOP	3/1/97	0700									
573	B-1	START	3/1/97	0700									
574	A-3	STOP	3/1/97	0700									
575	A-2	START	3/1/97	0700									
576	A-1	STOP	3/1/97	0700									
577	MIXED	START	3/1/97	1100	G	HY	L	1	1	97-1621	97-1621	4°C	PH

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	1 - COOL TO 4 C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	2 - HNO3, pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	3 - H2SO4, pH<2
	SS - SEMI SOLID	V - VOA	4 - NaOH, pH>12
			5 - HCL, pH<2
			6 - 0.008% Na2S2O3, 4 C
			7 - FIELD FILTER
			8 - NONE

TURNAROUND (DAYS): (FOR RUSH TURNAROUND STATE REASON BELOW)
 COMMENTS:

REGULATION APPLIED:	
RCRA ()	HRSD ()
SDWA ()	TSCA ()
CWA ()	PHOTO ()
CAA ()	OTHER ()

SAMPLING/COLLECTION CHARGE: \$
 POSSIBLE SAMPLE HAZARDS:
 COMMENTS:

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 2.6°C

D.O. NUMBER: 227/064 INIT.:
 CONTRACT LAB: DATE:
 CONTRACT NO.(S):
 OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
 *ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY		CHECK BOX & INITIAL IF OKAY		SAMPLES VERIFICATION	
HOLDING TIME ()	CONTAINERS ()	INITIAL	REJECTED ()	REASON:	INITIAL
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>3/1/97 1310</u>	
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>2/12/97 1405</u>	
RELINQUISHED BY: <u> </u>	REC'D BY: <u> </u>	REC'D BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM



PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



ENVIRONMENTAL

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.: Douglas Kirk
COMMAND: Oceana NAS

LAB USE ONLY LINE ITEM # / SAMPLE NO	SAMPLE ID / LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
578	Feeds	START	7/19/91	11:20	G	HY	L	1	1	TOXICITY			
		STOP		Am						10 + / CM	97.624		4°C
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Toxicity Test Sample Chain of Custody
(Please complete all information)

#573



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number B-1 8H Frequency of collection _____ Volume _____

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.11 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00 A.M.</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 A.M.</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinqu. by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Rel. by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1619 Arrival Temperature 20°C On ice? yes

Color tan Odor earthy Solids none

pH 7.36 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 19.7 °C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A



OBSERVATIONS

JRA# 97-1619

VPDES#: N/A

NPDES#: N/A
ORGANISM SOURCE: ABS

CLIENT: Denna

END

OUTFALL: 3 B-

ORGANISM SOURCE: _____

JRA BATCII#: C202

DATE: 2/6/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 961611C

PPDES#: N/A CLIENT: Olema OUTFALL: 3 B-1
ORGANISM SOURCE: ABS IRA BATCH#: W442 WATCH DATE: 5/1/07

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

Acute Mysidopsis bahia Toxicity Test

" C. variegatus "

GENERAL COMMENTS

JRA# 97-1617

NPDES#: NH CLIENT: OceanaOUTFALL: 3 B-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.7	8.02	/	8.2	/	1	20	/	/


DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

1997

Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14 _____
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0859 _____
 Minutes _____ Amount _____ Amount _____ Init LDC LDC LDC LDC _____

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	4201

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>OS</u>
Control	1000	100	0	Volume to 1000	NUMBER OF ORGANISMS	<u>OS</u>		
6.25			62.5		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>OS</u>								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 OS 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature OS Baxter VWR diel-thermo OS 7A5 DC1 N/A
 Chlorine Fischer & Porter 821A009U23 3811A940230-1 A
 COMMENTS: _____

February 20, 1997



Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 572

Sample ID: B-2

JRA ID: 97-1618

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlone
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-1618

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 2/12/97 Time 16:15

Test End: Date 2/14/97 Time 15:25

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 7.96</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1618 Test Type&Organism: Acute Mysisidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.2 - 8.3</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1618 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-1618

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:15</u>
Test End:	<u>2/14/97</u>	<u>16:10</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 8.02</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1618 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1618 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

CLIENT INFORMATION

COMPANY/COMMAND: DEERDA, A (15) CODE:

CONTACT: Donna Kink

PHONE: 433-3439 EXT: FAX:

J.O. #: 191224c

SIGNATURE:

PERMIT NO.:

LAB USE ONLY LINE ITEM # / SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	204617153	97-1617	4°C	4°C
572	B-2	STOP	2/1/97	0700							97-1618		
573	B-1	START	2/1/97	0700							97-1619		
574	A-3	STOP	2/1/97	0700							97-1620		
575	A-2	START	2/1/97	0700							97-1621		
576	A-1	STOP	2/1/97	0700							97-1622		
577	MIXED B-2 R.F.	START	2/1/97	1100	G	HY	L	1	1		97-1623		

TYPE	MATRIX	SW - SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	1 - COOL TO 4 C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE	5 - HCL, pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID	2 - HNO3, pH<2
	SS - SEMI SOLID	V - VOA	H - HEXANE RINSED	6 - 0.008% Na2S2O3, 4 C
				3 - H2SO4, pH<2
				7 - FIELD FILTER
				4 - NaOH, pH>12
				8 - NONE

TURNAROUND (Days): (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS:

SAMPLING/COLLECTION CHARGE: \$

POSSIBLE SAMPLE HAZARDS:

COMMENTS:

REGULATION APPLIED:

RCRA () HRSD ()
SDWA () TSCA ()
CWA () PHOTO ()
CAA () OTHER ()

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 26°C

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).

*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY!!		CHECK BOX & INITIAL IF OKAY:		SAMPLES VERIFICATION		REASON:		INITIAL	
HOLDING TIME ()	CONTAINERS ()	INITIAL	REJECTED ()	COMPANY/COMMAND:	DATE/TIME:	COMPANY/COMMAND:	DATE/TIME:	INITIAL	DATE/TIME:
REINQUIRED BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>2/1/97 1330</u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>2/1/97 1330</u>	INITIAL	DATE/TIME:
REINQUIRED BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>2/12/97 1405</u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u>2/12/97 1405</u>	INITIAL	DATE/TIME:
REINQUIRED BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	RECD BY: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	COMPANY/COMMAND: <u> </u>	DATE/TIME: <u> </u>	INITIAL	DATE/TIME:

Toxicity Test Sample Chain of Custody
(Please complete all information)

#572



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number B-2 8 Hr. Frequency of collection _____ Volume _____

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.02 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Kathy C. Ford</u>	Date <u>2-12-97</u>	Time <u>10:00 AM</u>
2.	Relinquished by <u>Kathy C. Ford</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Received by <u>Shirley</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinquished by <u>D. J. Turner</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Relinquished by <u>Reed</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1618 Arrival Temperature 2.0°C On ice? yes

Color Tan Odor earthy Solids none

pH 7.26 DO (mg/L) 7.8 Conductivity (umhos/cm) 1800 @ 15°C

Salinity (ppt) 1 TRC (mg/L) NA Method NA

OBSERVATIONS

IRAH 97-1618

RESID: 71A-

CLIENT: Diana Gyu

Q11 JRA BATCH#: r/442

OUTFALL: 2 B-2

ORGANISM SOURCE: ABS

WATCH DATE: 2/8/97

TIME (%) Surv.	REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)						TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	24	48	0	END	
C	A		10	10	48	8.66	8.31	8.03	7.5	6.4	6.5	20.3	20.0	20.6	20					
100	B		10	10	10															
12.25	A		10	10	10	8.62	8.27	8.00	7.7	6.6	6.2	20.4	20.0	20.6	20					
100	B		10	10	10															
12.5	A		10	9	9	8.51	8.25	7.94	7.8	6.5	5.8	20.4	20.0	20.6	20					
95	B		10	10	10															
25	A		10	10	10	8.38	8.21	7.91	8.0	6.7	5.4	20.3	20.0	20.6	20					
100	B		10	10	10															
50	A		10	10	10	8.20	8.13	7.94	8.1	6.8	5.4	20.0	20.0	20.6	20					
100	B		10	10	10															
100	A		10	9	9	7.87	7.96	7.96	8.3	6.8	6.2	19.5	20.0	20.6	20					
90	B		10	9	9															

1550 ALBC

INIT	DATE 1997	TIME
D83	2/12	1615
D83	2/13	1615
	2/14	1525

NPDES#: N/ACLIENT: Ocean ODUOUTFALL: 2 B-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.5	7.87	/	8.3	/	1	20	/	/


DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

1997

Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0859
 Minutes _____ Amount _____ Amount _____ Init LOG LOG LOG LOG

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			<u>OS</u>
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	<u>OS</u>		
6.25			625		STATISTICAL ANALYSES	<u>N/A</u>		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: <u>OS</u>								

TEST CHAMBER SIZE: 250mL TYPE: polyethylene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 OS 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature OS VWR dig-i-thermo OS 7A5 QCI N/A
 Chlorine Fischer & Porter 321A009U23 8811A940230-1 A
 COMMENTS: _____



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 571

Sample ID: B-3

JRA ID: 97-1617

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Claborn
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-1617

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:10</u>
Test End:	<u>2/14/97</u>	<u>15:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	.
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.87 - 7.97</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1617 Test Type&Organism: Acute Mysisidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.1 - 8.2</u>	<u>6.4 - 7.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: N/A
Growth/Reproduction: N/A

JRA #: 97-1617 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-1617

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 2/12/97 Time 16:10

Test End: Date 2/14/97 Time 16:06

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 6 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.97 - 8.08</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1617 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.2</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1617 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 2/18/97
Result (mg/L) 27
QC Range (mg/L) 0 thru 34

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY
CODE 930 BLDG Z-140
9742 MARYLAND AVENUE
NORFOLK, VA 23511 - 3095
PH: (757)445-8851 FAX: (757)445-8852

ENVIRONMENTAL

CLIENT INFORMATION

COMPANY/COMMAND: DEANNA A. AG CODE:
CONTACT: DOUGLAS KIVK
PHONE: 433-3439 EXT: FAX:
J.O. #: 1912270
SIGNATURE:
PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN START STOP	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER
571	B-3	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1	201616163 MB/6V	97-1417	4°C	4°C
572	B-2	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1		97-1618		
573	B-1	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1		97-1619		
574	A-3	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1		97-1420		
575	A-2	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1		97-1421		
576	A-1	START 3/11/97 0700 STOP 3/11/97 0700	3/11/97	0700	G	HY	L	1	1		97-1622		
577	MIXED L & R	START 3/11/97 1100 STOP 3/11/97 1100	3/11/97	1100	G	HY	L	1	1		97-1423		

TYPE	MATRIX	SW	SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	S - SOLID	P - PLASTIC	B - BAG	1 - COOL TO 4°C
CF - COMPOSITE, FLOW	S - SOLID	GS - GAS	GL - GLASS	C - CARTRIDGE	2 - HNO ₃ pH<2
CT - COMPOSITE, TIME	GS - GAS	SS - SEMI SOLID	T - TEFLON	TL - TEFLON LINED LID	3 - H ₂ SO ₄ pH<2
			V - VOA	H - HEXANE RINSED	4 - NaOH pH>12
					5 - HCL pH<2
					6 - 0.008% Na ₂ S ₂ O ₃ , 4°C
					7 - FIELD FILTER
					8 - NONE

TURNAROUND (Days): (FOR RUSH TURNAROUND STATE REASON BELOW)
COMMENTS:

REGULATION APPLIED:	
RCRA ()	HRSD ()
SDWA ()	TSCA ()
CWA ()	PHOTO ()
CAA ()	OTHER ()

SAMPLING/COLLECTION CHARGE: \$
POSSIBLE SAMPLE HAZARDS:
COMMENTS:

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 2.6°C1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

FOR LAB USE ONLY		CHECK BOX & INITIAL IF OKAY:		SAMPLES VERIFICATION		REASON:	
HOLDING TIME ()	CONTAINERS ()	INITIAL:	REJECTED ()	REASON:	INITIAL:	REASON:	INITIAL:
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>
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D.O. NUMBER: 227/067 INIT:
CONTRACT LAB: DATE:
CONTRACT NO(S):
OFFICIAL USE ONLY

CONTINUATION SHEET

SHEET 2 OF 2



9742 MARYLAND AVENUE
NORFOLK, VA 23511 - 3095
PH: (757)445-8851 FAX: (757)445-

P.O.C.: Douglas Kirk
COMMAND: O'Farrell NAS

[illegible]

COMMENTS:

Arrival Temp. 20°C *ds*
ING AND ANALYSIS OF SAMPLE(S). •

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO.(S):	
OFFICIAL USE ONLY	

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. – THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM – 3:30 PM).

**FOR LAB USE ONLY		CHECK BOX & INITIAL IF OKAY:		SAMPLES VERIFICATION		DATE TIME	
HOLDING TIME ()	CONTAINERS ()	INITIAL:	REJECTED ()	REASON:	INITIAL:	DATE TIME:	
	7	21/12/87		BT-5	BT-5	21/12/87	1330
RELINQUISHED BY:	21/12/87	BT-5					
RELINQUISHED BY:	21/12/87	BT-5					
RELINQUISHED BY:	21/12/87	BT-5					
RELINQUISHED BY:	21/12/87	BT-5					

Toxicity Test Sample Chain of Custody
(Please complete all information)

#571



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 7:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number B-3. 8 Hr. Frequency of collection _____ Volume _____

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.09 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment Bayside

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>Keth C. P.</u>	Date <u>2/12/97</u>	Time <u>10:00 AM</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15 AM</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Received by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-1617 Arrival Temperature 2.0°C On ice? yes

Color tan Odor earthy Solids none

pH 7.32 DO (mg/L) 8.0 Conductivity (umhos/cm) 1800 @ 19.3 °C

Salinity (ppt) 1 TRC (mg/L) NA Method NA



SECTION 11A

CLIENT: *Deena*

OUTFALL: (B-3

ORGANISM SOURCE: ABS

JRA BATCH#: 11442

HATCH DATE: 2/8/97

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

0259

NPDES#: NA CLIENT: Oceana EOL OUTFALL: B-3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1900	2/12/97	19.3	7.97	/	8.2	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (mysid)

1997

Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14 _____
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0359 _____
 Minutes _____ Amount _____ Amount _____ Init LOG LOG LOG LOG _____

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	BS		
6.25			62.5		STATISTICAL ANALYSES	NA		
12.5			125					
25			250					
50			500					
100			1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 BS 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature BS Buxton VWR dig-i-thermo BS 745 DC1 n/a
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A
 COMMENTS: _____



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 577

Sample ID: Mixed L. of R.R.

JRA ID: 97-1623

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlone
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mixed L. of R.R. JRA #: 97-1623

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	<u>Date</u> <u>2/12/97</u>	<u>Time</u> <u>16:40</u>
Test End:	<u>2/14/97</u>	<u>16:00</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.94 - 8.09</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1623 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>5.5 - 8.4</u>	<u>6.4 - 7.5</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1623 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date 2/11/97

Result (mg/L) 0.15

QC Range (mg/L) 0.04 thru 0.24

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mixed L. of R.R. JRA #: 97-1623

Test Period for Which Data is Being Submitted:
(i.e., first quarter, semiannual, or annual) _____

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:40</u>
Test End:	<u>2/14/97</u>	<u>17:00</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.09</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.1 - 8.4</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-1623 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u> thru <u>34</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mixed L. of R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY
 CODE 930 BLDG Z-140
 9742 MARYLAND AVENUE
 NORFOLK, VA 23511 - 3095
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

CLIENT INFORMATION

COMPANY/COMMAND: DEANNA A (A) CODE:
 CONTACT: Douglas K. M.
 PHONE: 433-3439 EXT: FAX:
 J.O. #: 1912210
 SIGNATURE:
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	2016/18/19	97-1617	4°C	
572	B-2	STOP	2/1/97	PM									
573	B-1	START	2/1/97	0700									
574	A-3	STOP	2/1/97	PM									
575	A-2	START	2/1/97	0700									
576	A-1	STOP	2/1/97	PM									
577	MIXED	START	2/1/97	1100	G	HY	L	1	1	2016/18/19	97-1621		
		STOP	2/1/97	PM									
		START	2/1/97	0700									
		STOP	2/1/97	PM									
		START	2/1/97	0700									
		STOP	2/1/97	PM									
		START	2/1/97	0700									
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		START	2/1/97	0700									
		STOP	2/1/97	PM									
		START	2/1/97	0700									
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		START	2/1/97	0700									
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		START	2/1/97	0700									
		STOP	2/1/97	PM									
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		STOP	2/1/97	PM									
		START	2/1/97	0700									
		STOP	2/1/97	PM									
		START	2/1/97	0700									
		STOP	2/1/97	PM									
		START	2/1/97	0700									
		STOP	2/1/97	PM									

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM



PWC ENVIRONMENTAL LABORATORY
CODE 930 BLDG Z-140
9742 MARYLAND AVENUE
NORFOLK, VA 23511 - 3095
PH: (757)445-8851 FAX: (757)445-8852

CONTINUATION SHEET

SHEET 2 OF 2

P.O.C.: Douglas Kirk
COMMAND: Oceana NAS

LAB USE ONLY LINE ITEM # / SAMPLE NO.	SAMPLE ID / LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
578	Feeds	START	9/11/91	11:20 AM	G	HY	L	1	1	TOXICITY	97.624	42.48	
		STOP											
		START											
		STOP											
		START											
		STOP											
		START											
		STOP											
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		STOP											
		START											
		STOP											
		START											
		STOP											

COMMENTS:

Arrival Temp. 20°C

D.O. NUMBER: _____ INIT.: _____

CONTRACT LAB: _____ DATE: _____

CONTRACT NO.(S): _____

OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

FOR LAB USE ONLY!!

HOLDING TIME () CONTAINERS () REJECTED () INITIAL: _____ REASON: _____

RELINQUISHED BY: _____ REC'D BY: _____ COMPANY/COMMAND: BCS Inc DATE/TIME: 2/12/96 133

RELINQUISHED BY: _____ REC'D BY: _____ COMPANY/COMMAND: BCS DATE/TIME: 2/12/97 1405

RELINQUISHED BY: _____ REC'D BY: _____ COMPANY/COMMAND: BCS DATE/TIME: _____

RELINQUISHED BY: _____ REC'D BY: _____ COMPANY/COMMAND: BCS DATE/TIME: _____

#577

Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 11:00 AM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number Mix. of R.R. Frequency of collection _____ Volume 2 L.

Temperature of sample in sample collection device 22.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 7.35 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1.	Relinquished by <u>H. YANG</u>	Date <u>2/12/97</u>	Time <u>9:00 AM</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:00</u>
2.	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Received by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>10:15</u>
	Relinquished by <u>[Signature]</u>	Date <u>2-12-97</u>	Time <u>1405</u>
	Relinquished by <u>[Signature]</u>	Date <u>2/12/97</u>	Time <u>1405</u>

FOR REED LAB USE ONLY

JRA# 97-16213 Arrival Temperature 2.0°C On ice? yes

Color tan Odor earth Solids 100

pH 7.43 DO (mg/L) 9.0 Conductivity (umhos/cm) 1800 @ 19.7°C

Salinity (ppt) 1 TRC (mg/L) NA Method NA



Acute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 77.1623

NPDES#: N/A

CLIENT: Ocean

ADU

OUTFALL: 7 Mix L. f.r.r

ORGANISM SOURCE: ABS

JRA BATCH#: C22

HATCH DATE: 2/6/97

Conc. % %Surv.	REp ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)					TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END		
0	A		10	10	10	8.66	8.42	8.30	7.5	7.7	8.4	22.3	19.5	20.6	20	20		
6.25	A		10	10	10	8.60	8.35	8.26	7.7	7.2	7.8	22.4	19.5	20.6	20	20		
100	B		10	10	10													
12.5	A		10	10	10	8.58	8.35	8.26	7.8	7.1	7.7	22.4	19.5	20.6	20	20		
100	B		10	10	10													
25	A		10	10	10	8.47	8.31	8.22	8.0	7.0	7.5	22.3	19.5	20.6	20	20		
100	B		10	10	10													
50	A		10	10	10	8.30	8.22	8.14	8.1	6.8	7.0	22.1	19.5	20.6	20	20		
100	B		10	10	10													
100	A		10	10	10	8.09	8.04	7.03	8.4	7.1	7.1	19.7	19.5	20.6	20	20		
100	B		10	10	10													
</																		

INIT	083	083	106
DATE 1997	2/6	2/13	2/14
TIME	1640	1630	1700

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



NPDES#: N/A CLIENT: Oceana COU

OUTFALL: 7 M.L. 42.

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1100	2/12/97	19.7	8.09	/	8.4	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 2/12/97 Date 2/12/97 Date 2/12/97 Date 2/12/97
 Method Method Method Method
 Minutes Amount Amount Init LDC LDC LDC LDC

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Volume to 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

CALCULATIONS PERFORMED BY: RB

VERIFICATION
OF:VERIFIED
BY:ANALYST
SIGNATURES

INITIALS

TREATMENT
PREPARATION
CALCULATIONSNUMBER OF
ORGANISMSSTATISTICAL
ANALYSES

RB

RB

N/A

RB

TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	Bentley VWR	diel-thermo	745 DC1	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



February 20, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0227-068

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 578

Sample ID: Feed S.

JRA ID: 97-1624

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Elaine Charlotte
for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-1624

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 2/12/97 Time 16:45

Test End: 2/14/97 16:02

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.63 - 7.92</u>	<u>8.03 - 8.66</u>
Adjusted	<u>N/A</u>	

JRA #: 97-1624 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.7 - 8.3</u>	<u>6.4 - 7.5</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u><6.25%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/11/97</u>	
Result (mg/L)		<u>0.15</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

DO dropped below 4.0 mg/L in the 12.5 - 100% treatments.

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-1624

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>2/12/97</u>	Time <u>16:45</u>
Test End:	<u>2/14/97</u>	<u>17:05</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>6 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.63 - 8.15</u>	<u>8.30 - 8.66</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u><0.1 - 8.3</u>	<u>7.5 - 8.4</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>31%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>2/18/97</u>	
Result (mg/L)		<u>27</u>	
QC Range (mg/L)		<u>0</u>	thru <u>34</u>

4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	E
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

DO dropped below 4.0 mg/L in all treatments.

CUMULATIVE DATA SUMMARY

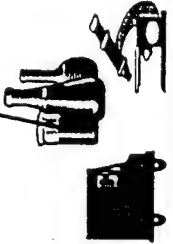
NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		

CHAIN-OF-CUSTODY RECORD



& ANALYSIS REQUEST FORM
 PWC ENVIRONMENTAL LABORATORY
 CODE 930 BLDG Z-140
 9742 MARYLAND AVENUE
 NORFOLK, VA 23511 - 3095
 ENVIRONMENTAL PH: (757)445-8851 FAX: (757)445-8852

CLIENT INFORMATION

COMPANY/COMMAND: DEAN'S ANALYSIS
 CONTACT: DOUGLAS KIM
 PHONE: 433-3439 EXT: FAX:
 J.O.#: 1912210
 SIGNATURE:
 PERMIT NO.:

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES / CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
											pH	TEMPERATURE	
571	B-3	START	2/1/97	0700	G	HY	L	1	1	TRAILER	97-1617	4°C	4°C
572	B-2	STOP	2/1/97	0700									
573	B-1	START	2/1/97	0700									
574	A-3	STOP	2/1/97	0700									
575	A-2	START	2/1/97	0700									
576	A-1	STOP	2/1/97	0700									
577	MIXED	START	2/1/97	1100	G	HY	L	1	1		97-1622		
		STOP	2/1/97	1100									

TYPE	MATRIX	SW - SWIPE	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	P - PLASTIC	B - BAG	1 - COOL TO 4°C
CF - COMPOSITE, FLOW	S - SOLID	GL - GLASS	C - CARTRIDGE	2 - HNO ₃ , pH<2
CT - COMPOSITE, TIME	GS - GAS	T - TEFLON	TL - TEFLON LINED LID	3 - H ₂ SO ₄ , pH<2
	SS - SEMI SOLID	V - VOA	TH - HEXANE RINSED	4 - NaOH, pH>12
				5 - HCL, pH<2
				6 - 0.008% Na ₂ SO ₃ , 4°C
				7 - FIELD FILTER
				8 - NONE

TURNAROUND (Days): (FOR RUSH TURNAROUND STATE REASON BELOW)
 COMMENTS:

REGULATION APPLIED:
 RCRA () HRSD ()
 SDWA () TSCA ()
 CWA () PHOTO ()
 CAA () OTHER ()

SAMPLING/COLLECTION CHARGE: \$
 POSSIBLE SAMPLE HAZARDS:
 COMMENTS:

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

Arrival Temp. 26°C

D.O. NUMBER: 227/067 INIT:
 CONTRACT LAB: DATE:
 CONTRACT NO. (S): OFFICIAL USE ONLY

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
 *ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

HOLDING TIME ()	CHECK BOX & INITIAL IF OKAY	CONTAINERS ()	INITIAL	REASON
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>
RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>	RELINQUISHED BY: <u> </u>

COMPANY/COMMAND: DEAN'S ANALYSIS
 DATE/TIME: 2/1/97 1330
 COMPANY/COMMAND:
 DATE/TIME: 2/12/97 1435
 COMPANY/COMMAND:
 DATE/TIME:

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM
PWC ENVIRONMENTAL LABORATORY
CODE 930 BLDG Z-140

9742 MARYLAND AVENUE
NORFOLK, VA 23511 - 3095
PH: (757)445-8851 FAX: (757)445-8852

CONTINUATION SHEET
SHEET 2 OF 2

P.O.C.: Douglas Kirk
COMMAND: Oceana NAS

LAB USE ONLY		SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES /CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #	SAMPLE NO											pH	TEMPERATURE	
000287	578	Feeds	START	2/11/97	11:20	G	HY	L	1	1	TOXICITY m + CM	97.6	4248	
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Toxicity Test Sample Chain of Custody
(Please complete all information)



Facility OLD DOMINION UNIVERSITY
Address DEPT. OF CIVIL & ENVIRONMENTAL ENG.
KDH 135 NORFOLK VA 23529-0241

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print&sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 2/11/97 Time 11:00 AM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number Feed S. Frequency of collection _____ Volume 2 L.

Temperature of sample in sample collection device 28.1°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? NA dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? _____ If yes - limit (mg/L) _____

Field pH 6.77 Field Total Residual Chlorine NA

Comments/Sample description _____

Type of test(s) to be performed MYSID & CYPRINODON ACUTE LC50
(Specify organisms) SHRIMP VARIEGATUS

Method of shipment By air

Print & Sign Names

1. Relinquished by H. YANG Date 2/12/97 Time 9:00 AM

Received by Keith Cantel Date 2-12-97 Time 10:00 AM

2. Relinquished by Keith Cantel Date 2-12-97 Time 10:15 AM

Received by S. Dordick Date 2-12-97 Time 10:15

Relinquished by James Date 2-12-97 Time 1405

Relinquished by James Date 2/12/97 Time 1405

FOR REED LAB USE ONLY

JRA# 97-1624 Arrival Temperature 2.0°C On ice? yes

Color light tan Odor yeasty Solids none

pH 7.29 DO (mg/L) 8.2 Conductivity (umhos/cm) 1700 @ 19.2°C

Salinity (ppt) 1 TRC (mg/L) N/A Method N/A

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 31%

DATE: 2/12/97
TOXICANT : Feed S.
SPECIES: C. variegatus

TEST NUMBER: 97-1624

DURATION: 48 hours

RAW DATA: Concentration ---- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	0
12.50	20	3
25.00	20	1
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 30.78
95% LOWER CONFIDENCE: 26.99
95% UPPER CONFIDENCE: 35.10

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.


 NPDES#: NA CLIENT: Oceana ODU OUTFALL: S Fit S

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
2/12/97	0	2/11/97 1100	2/12/97	19.2	7.63	/	8.3	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

 Date _____ Date _____ Date _____ Date 2/12 2/13 2/13 2/14
 Method _____ Method _____ Method _____ Time 1718 0850 1645 0859
 Minutes _____ Amount _____ Amount _____ Init L06 L06 L06 L06

 DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
2/12/97	0	2/12/97	20.3	8.66	7.5	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS

CONC. (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)
Control	1000	100	0	Dilute to 1000
6.25	↓	↓	62.5	↓
12.5	↓	↓	125	↓
25	↓	↓	250	↓
50	↓	↓	500	↓
100	↓	↓	1000	0

 CALCULATIONS PERFORMED BY: RS

 VERIFICATION
OF:

 VERIFIED
BY:

 ANALYST
SIGNATURES

INITIALS

 TREATMENT
PREPARATION
CALCULATIONS

 NUMBER OF
ORGANISMS

 STATISTICAL
ANALYSES

RS

 TEST CHAMBER SIZE: 250mL TYPE: polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digi-thermo	<u>745 QCI</u>	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:

ACUTE TOXICITY TEST RESULTS

60 ppm AFFF

MARCH 25, 1997



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 679

Sample ID: A-1

JRA ID: 97-3354

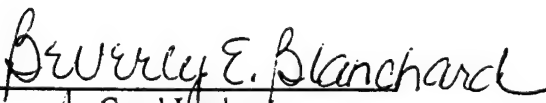
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3354

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:04</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.15</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3354 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.2 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3354

Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50

>100%

Survival

(NOEC)

(LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Growth or Reproduction

(NOEC)

(LOEC)

Normal Distribution (yes/no)

Homogeneous Variance (yes/no)

Reference Toxicant Test Date

3/26/97

Result (mg/L)

0.09

QC Range (mg/L)

0.04

thru

0.244. Equipment

(Make

Model

Serial #

Probe #)

pH meter

Corning

245

5147

G

DO meter

YSI

54ARC

14522

N

SCT meter

YSI

33

4458

A

Temperature

VWR

digi-thermo

7A5 QC1

N/A

Chlorine

Fischer

& Porter 821A009423

8811A940230-1

A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3354

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:19</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.02 - 8.19</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3354 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3354 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

pwc #679



Facility ODU
Address Dept. of Civil & Environ. Eng. ODU
Norfolk, VA 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print & sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number A-1, 8 Hr. Frequency of collection _____ Volume 2 L.

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? No. If yes - limit (mg/L) _____

Field pH 7.51 Field Total Residual Chlorine _____

Comments/Sample description A-1, 8 Hr.

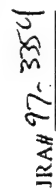
Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp
Method of shipment Reel

Print & Sign Names

1. Relinquished by -Yang Date 03/25/97 Time 9:00 PM
Received by Keith C. Miller Date 3-26-97 Time 11:00
2. Relinquished by Keith C. Miller Date 3-26-97 Time 11:10
Received by Althea Miller Date 3/26/97 Time 11:25 #679
See PWC C.O.C.

FOR REED LAB USE ONLY

JRA# 97-3354 Arrival Temperature 2.4°C On ice? yes
Color +Cn Odor earthy Solids none
pH 7.92 DO (mg/L) 9.0 Conductivity (µmhos/cm) 1800 @ 19.2°C
Salinity (ppt) 1 TRC (mg/L) — Method —



Adult *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

UPDES#:
11(A

CLIENT: Dream

2008

OUTFALL.

ORGANISM SOURCE: ABS

JIRA BATCH#: 6206

MATCH DATE: 3/22/97

Conc. %		REPLY ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
% Surv.	HOURS⇒		0	24	48	0	24	48	0	24	48	0	END
0	A	10	10	10	10	8.44	8.25	8.28	6.6	7.7	8.2	20	20
100	B	10	10	10	10	8.43	8.27	8.28	7.3	7.8	8.0	20	20
6.25	A	10	10	10	10	8.41	8.26	8.28	7.4	7.7	8.1	20	20
100	B	10	10	10	10	8.36	8.23	8.27	7.6	7.7	8.1	20	20
12.5	A	10	10	10	10	8.24	8.18	8.25	8.1	7.7	8.1	20	20
100	B	10	10	10	10	8.02	8.05	8.19	9.0	7.6	8.0	20	20
50	A	10	10	10	10								
100	B	10	10	10	10								
100	A	10	10	10	10								
100	B	10	10	10	10								

INIT	DATE 1997	TIME
083	3/26	1635
083	3/27	1604
083	3/28	1619

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



the *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-334

PDES#: N/A CLIENT: Ocean ODU OUTFALL: A-1
ORGANISM SOURCE: Chesapeake Bay HATCH DATE: 3/25/97 1430 0800
JRA BATCH#: M454

Conc. (%)	REP	HOURS	NUMBER OF LIVE ORGANISMS		pH		DISSOLVED OXYGEN (mg/L)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	72	96	0	24	48	72	0	END
0	A	0	10	10	10	8.44	8.28	8.24	6.6	7.8	8.0	20.5	20.1	20.1	20	20
2.5	A	0	10	10	9	8.43	8.26	8.19	7.3	7.5	7.3	20.5	20.1	20.1	20	20
5	B	0	10	10	10	8.41	8.26	8.22	7.4	7.5	7.4	20.4	20.1	20.1	20	20
12.5	A	0	10	10	10	8.36	8.24	8.21	7.6	7.6	7.3	20.4	20.1	20.1	20	20
25	A	0	10	10	10	8.24	8.18	8.20	8.1	7.6	7.4	20.2	20.1	20.1	20	20
50	A	0	10	10	10	8.02	8.06	8.05	9.0	7.5	7.2	19.2	20.1	20.1	20	20
100	B	0	10	10	10											
100	A	0	10	10	10											
100	B	0	10	10	10											

INIT.	DATE	TIME
153	3/26	1630
153	3/27	1630
153	3/28	1630

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)



DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.2	8.02	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 0950 Method 1700 Method 1020
 Minutes Amount Amount Init 053 126 126 126

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Diluent + 1000	NUMBER OF ORGANISMS	053		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>053</u>								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	000 26 203
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>053</u> <u>VWR</u>	digi-thermo	<u>053</u> <u>7A5 QCI</u>	n/a
Chlorine	Fischer & Porter	321A009U23	8811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 678

Sample ID: A-2

JRA ID: 97-3353

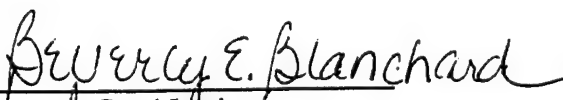
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3353

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:30

Test End: 3/28/97 16:06

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.18</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3353 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3353 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-2 JRA #: 97-3353

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.04 - 8.20</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3353 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA # 97-3353 Test Type&Organism: Acute Cyprinodon variegatus

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	<u>Corning</u>	<u>245</u>	<u>5147</u>	<u>G</u>
DO meter	<u>YSI</u>	<u>54ARC</u>	<u>14522</u>	<u>N</u>
SCT meter	<u>YSI</u>	<u>33</u>	<u>4458</u>	<u>A</u>
Temperature	<u>VWR</u>	<u>digi-thermo</u>	<u>7A5 QC1</u>	<u>N/A</u>
Chlorine	<u>Fischer</u>			
	<u>& Porter</u>	<u>821A009423</u>	<u>8811A940230-1</u>	<u>A</u>

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

pwc # 678



Facility ODU
Address Dept. Civil & Environ Eng. ODU.
Norfolk, VA 22508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print&sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number A-2, 8th Frequency of collection _____ Volume 2L

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? No If yes - limit (mg/L) _____

Field pH 7.56 Field Total Residual Chlorine _____

Comments/Sample description A-2, 8th

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Keith C. Felt Date 3-26-97 Time 11:00
2. Relinquished by Keith C. Felt Date 3-26-97 Time 11:10
Received by Althea Miller Date 3/26/97 Time 1125 #678
22 PWC C-02

FOR REED LAB USE ONLY

JRA# 97-3353 Arrival Temperature 24°C On ice? yes
Color tan Odor earthy Solids none
pH 7.96 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 19.3 °C
Salinity (ppt) 1 TRC (mg/L) — Method —



the *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-3353

PDES#: N/A CLIENT: Ocean ODU OUTFALL: A-2
ORGANISM SOURCE: Chesapeake Bay JRA BATCH#: M454 HATCH DATE: 3/25/97 1430-0800

unc (%) % Surv.	REP ↓	HOURS →	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	END
0	A	0	10	10	10	8.44	8.28	8.24	25	21	21	20	20
100	B	0	10	10	10	8.44	8.23	8.21	24	21	21	20	20
2.25	A	0	10	10	10	8.42	8.23	8.21	23	21	21	20	20
100	B	0	10	10	10	8.31	8.22	8.25	23	21	21	20	20
12.5	A	0	10	10	10	8.25	8.15	8.22	20	21	21	20	20
100	B	0	10	10	10	8.04	8.18	8.14	19.3	20.1	20.1	20	20
25	A	0	10	10	10								
100	B	0	10	10	10								
50	A	0	10	10	10								
100	B	0	10	10	10								
100	A	0	10	10	10								
100	B	0	10	10	10								
INIT			08	28	05								
DATE 1997			3/26	3/27	3/28								
TIME			1630	1645	1646								

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* " " "

GENERAL COMMENTS

JRA# 97-3353

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4; <9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.3	8.04	✓	9.0	✓	1	20	✓	✓

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 0950 Method 1700 Method 1020
 Minutes 1033 Amount LXG Amount LXG Amount LXG

DILUENT: 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4; <9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	1033		1033
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: 1033								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 203 26
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature 1033 VWR diel-thermo 1046303 TAS DC1 n/a
 Chlorine Fischer & Porter 821A009U23 8811A940230-1 A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 677

Sample ID: A-3

JRA ID: 97-3352

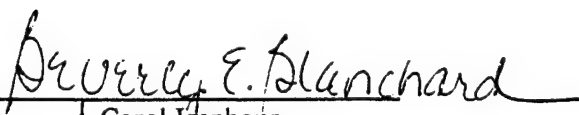
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-3 JRA #: 97-3352

Test Period for Which Data is Being Submitted:
(i.e., first quarter, semiannual, or annual) _____

SUMMARY OF TEST CONDITIONS

Test Start: Date Time
 3/26/97 16:30

Test End: 3/28/97 16:07

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.07 - 8.16</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3352 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3352 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: A-1 JRA #: 97-3352

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:21</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.08 - 8.19</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3352 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.7 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3352 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

A-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

PWC # 677



Facility ODU
Address Dept. Civil & Environ. Eng. ODU
Norfolk, VA 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print&sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number A-3 8Hr Frequency of collection _____ Volume 2L

Temperature of sample in sample collection device 25.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? No If yes - limit (mg/L) _____

Field pH 7.59 Field Total Residual Chlorine _____

Comments/Sample description A-3. 8Hr.

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp.
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Keith Cuff Date 3-26-97 Time 11:00 AM
2. Relinquished by Keith Cuff Date 3-26-97 Time 11:10 AM
Received by U. Anderson Date 3/26/97 Time 1125 #677
See PWC C-02

FOR REED LAB USE ONLY

JRA# 97-3352 Arrival Temperature 2.4°C On ice? yes
Color tan Odor earthy Solids None
pH 8.03 DO (mg/L) 8.9 Conductivity (µmhos/cm) 1800 @ 19.4°C
Salinity (ppt) 1 TRC (mg/L) - Method -



ute *Cyprinodon variegatus* Toxicity Test

OBSERVATIONS

JRA# 97-3352

PDES#: 11A
ORGANISM SOURCE: APSS

CLIENT: Ocean DDU

OUTFALL: A-3
HATCH DATE: 3/22/97

JRA BATCH#: C206

Time % Surv.	REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	24	0	END
0	A		10	10	10	8.44	8.25	8.28	6.6	7.7	8.2	28.5	19.5	19.7	20	20	20	
100	B		10	10	10	8.42	8.29	8.28	7.2	7.8	8.2	28.4	19.5	19.7	20	20	20	
6.25	A		10	10	10	8.40	8.28	8.29	7.4	7.7	8.1	28.4	19.5	19.7	20	20	20	
100	B		10	10	10	8.32	8.25	8.26	7.7	7.7	8.1	28.3	19.5	19.7	20	20	20	
12.5	A		10	10	10	8.21	8.17	8.24	8.1	7.4	8.0	28.2	19.5	19.7	20	20	20	
100	B		10	10	10	8.09	8.08	8.19	9.0	7.7	8.0	19.4	19.5	19.7	20	20	20	
25	A		10	10	10													
50	B		10	10	10													
75	A		10	10	10													
100	B		10	10	10													
80	A		10	10	10													
	B		10	10	10													

INIT	183	183	183
DATE 1997	3/26	3/27	3/28
TIME	1435	1447	1621

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* "

GENERAL COMMENTS

JRA# 97-3352

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: A3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/26/97 2100	3/26/97	19.4	8.09	/	7.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 1700 Method 1700 Method 1700
 Minutes 100 Amount 100 Amount 100 Amount 100

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Diluent 1000	NUMBER OF ORGANISMS	100		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250mlTYPE: PolystyreneVOLUME OF TEST SOLUTION: 200ml

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>26</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digit-thermo	<u>745 QCI</u>	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 676

Sample ID: B-1

JRA ID: 97-3351

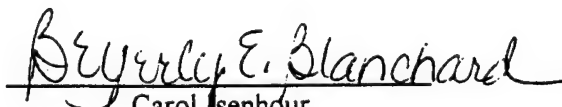
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3351

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:09</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.05 - 8.14</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3351 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>6.8 - 9.2</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3351 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		0.04	thru 0.24

4. Equipment

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147-	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-1 JRA #: 97-3351

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:26</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.01 - 8.17</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3351 Test Type&Organism: Acute (*Cyprinodon variegatus*)

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 9.2</u>	<u>6.6 - 8.2</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3351 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-1

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

pwc # 676



Subsamples comprising composite:

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Keith Cuff Date 3-26-97 Time 11:00 AM

2. Relinquished by Keith Cuff Date 3-26-97 Time 11:10 AM
Received by Reeder Miller Date 3/26/97 Time 11:25

-Sgt. PWC C-OC

626

JRA# 97-3351 Arrival Temperature 2.4°C On ice? yes
Color tan Odor earthy Solids none
pH 7.50 DO (mg/L) 8.8 Conductivity (μ mhos/cm) 1900 @ 20.0°C
Salinity (ppt) 1 TRC (mg/L) - Method -

PDF# 11(A)

CLIENT: Dream

OUTFALL: B-1

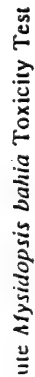
ORGANISM SOURCE: ABS

JIRA BATCH#: C206

HATCH DATE: 3/22/97

[illegible]

INIT	083	083	083
DATE 1997	3/26	3/27	3/28
TIME	1635	1625	1626



OBSERVATIONS

JRA# 97-351

PPES#:

N/A

PPDES#: N/A CLIENT: Chesapeake Cutures

CLIENT: Oscar
 ODU

OUTFALL: B-1

HATCH DATE: 3/25.26/57 142-0800

[illegible]

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* "

GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OYUOUTFALL: B-1

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.0	8.07	9.2			20.1	20		

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 0950 Method 1700 Method 1020
 Minutes 053 Amount LOG Amount LOG Amount LOG

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			BS
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	BS		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: BS								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 200 200
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature BS WVR digi-thermo 745 GC1 n/a
 Chlorine Fischer & Porter 921A009U23 3811A940230-1 A
 COMMENTS: _____



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 675

Sample ID: B-2

JRA ID: 97-3350

Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,

Beverly E. Blanchard
Carol Benhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3350

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date Time
 3/26/97 16:30

Test End: 3/28/97 16:13

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL -

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.93 - 8.07</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3350 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage?	<u>N/A</u>
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3350 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-2 JRA #: 97-3350

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:35</u>
Test End:	<u>3/28/97</u>	<u>16:30</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Cyprinodon variegatus</u>	Age: <u>4 days</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.93 - 8.16</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3350 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3350 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-2

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

pwc # 675



Facility ODU
Address Dept. Civil & Environ. Eng ODU
Norfolk, VA 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print & sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number B-2. 8Hr. Frequency of collection _____ Volume 2L
Temperature of sample in sample collection device 25.0°C
Final temperature of effluent at sample collection point _____
Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)
Is the sample chlorinated? No dechlorinated? _____ If so, how? _____
Permit with interim chlorine limit? No If yes - limit (mg/L) _____
Field pH 7.63 Field Total Residual Chlorine _____
Comments/Sample description B-2. 8Hr.

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon variegatus & Mysid shrimp
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Lith Confal Date 3-26-97 Time 11:00 A.M.
2. Relinquished by Lith Confal Date 3-26-97 Time 11:10 A.M.
Received by Arthur D. Miller Date 3/26/97 Time 11:25
See PWC C-00-

#675

FOR REED LAB USE ONLY

JRA# 97-3350 Arrival Temperature 2.4°C On ice? yes
Color tan Odor earthy Solids none
pH 7.78 DO (mg/L) 9.0 Conductivity (umhos/cm) 1900 @ 20.0 °C
Salinity (ppt) 1 TRC (mg/L) - Method -



JRA# 97-3350

OBSERVATIONS

Acute *Cyprinodon variegatus* Toxicity TestNPDES#: 11A CLIENT: Ocean DDU OUTFALL: B-2
ORGANISM SOURCE: ABS JRA BATCH#: C206 HATCH DATE: 3/22/97

Cult. % % Surv.	HOURS	REP #	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.44	8.25	8.28	6.6	7.7	8.2	20.5	19.5	19.7	20	20
100	B		10	10	10											
6.25	A		10	10	10	8.40	8.19	8.18	7.2	7.1	7.4	20.5	19.5	19.7	20	20
100	B		10	10	10											
12.5	A		10	10	10	8.35	8.25	8.22	7.3	7.4	7.4	20.6	19.5	19.7	20	20
100	B		10	10	10											
25	A		10	10	10	8.27	8.22	8.24	7.4	7.5	7.4	20.6	19.5	19.7	20	20
100	B		10	10	10											
50	A		10	10	10	8.14	8.16	8.21	8.0	7.5	7.4	20.4	19.5	19.7	20	20
100	B		10	10	10											
100	A		10	10	10	7.93	8.00	8.16	9.0	7.5	7.8	20.0	19.5	19.7	20	20
100	B		10	10	10											

INIT	983	985	983		
DATE 1997	3/26	3/27	3/28		
TIME	1635	1630	1630		

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

IRAH# 97-3350

OBSERVATIONS

acute *Mysidopsis bahia* Toxicity Test

#33047
N/A

CLIENT: Dean

CLIENT: Dean

OUTFALL: B-2

ORGANISM SOURCE: Chesapeake Cultures JRA BATCH#: ml64 IIATCH DATE: 3/25/97 1430 - 0899

[illegible]

INIT	153	08	053		
DATE	1/26	4/27	7/28		
TIME	11:20	1:00	1:013		

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" *C. variegatus* " " "

GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: B-2

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.0	7.93	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 1700 Method 1020
 Minutes 153 Amount 106 Amount 106

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	40.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/l)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			B
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	153		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100	✓	✓	1000	0				
CALCULATIONS PERFORMED BY: <u>BS</u>								

TEST CHAMBER SIZE: 250ml TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL
 EQUIPMENT Make Model Serial Number Probe Number
 pH meter Corning 245 5147 226
 DO meter YSI 54ARC 14522 N
 SCT meter YSI 33 4458 A
 Temperature Boxer VWR 7AS QCI n/a
 Chlorine Fischer & Porter 321A009U23 3811A940230-1 A
 COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 674

Sample ID: B-3

JRA ID: 97-3349

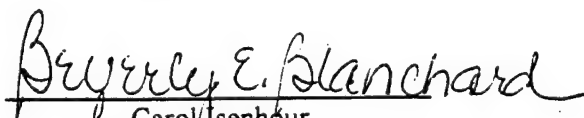
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3349

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:20</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.91 - 8.14</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3349 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.3 - 8.9</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3349 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: B-3 JRA #: 97-3349

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:35

Test End: 3/28/97 16:37

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.91 - 8.17</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3349 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.8 - 8.9</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3349 Test Type&Organism: Acute (*Cyprinodon variegatus*)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 >100%

Survival (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Growth or Reproduction (NOEC) (LOEC)
Normal Distribution (yes/no)
Homogeneous Variance (yes/no)

Reference Toxicant Test Date 3/31/97
Result (mg/L) >40
QC Range (mg/L) 2 thru 36

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

B-3

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

PWC# 674



Facility ODU
Address Dept. Civil & Environ. Eng. ODU
Norfolk, VA 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print&sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number B-3. 8Hr Frequency of collection _____ Volume 2L
Temperature of sample in sample collection device 25.0°C
Final temperature of effluent at sample collection point _____
Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No. dechlorinated? _____ If so, how? _____
Permit with interim chlorine limit? No. If yes - limit (mg/L) _____
Field pH 7.50 Field Total Residual Chlorine _____
Comments/Sample description B-3. 8Hr.

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp.
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Keith Craft Date 3-26-97 Time 11:00 A.M.
2. Relinquished by Keith Craft Date 3-26-97 Time 11:10 A.M.
Received by Andrew Ziehl Date 3/26/97 Time 1125

see PWC C.O.C

FOR REED LAB USE ONLY

JRA# 97-3349 Arrival Temperature 2.4°C On ice? yes
Color TCN Odor earthy Solids None
pH 7.74 DO (mg/L) 8.8 Conductivity (μ mhos/cm) 1900 @ 21 °C
Salinity (ppt) 1 TRC (mg/L) - Method -



OBSERVATIONS

JRA# 97-3349

A:

CLIENT: Dream DDM

OUTFALL:

NPDES#: 111A
ORGANISM SOURCE: ABS

JRA BATCH#: C206

HATCH DATE: 3/22/97

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



OBSERVATIONS

JRA# 97-3349

NPDES#: N/A

CLIENT: Dear:

OUTFALL: B-3

ORGANISM SOURCE: Chrysomelid Cultures
JRA BATCH#: M454
HATCH DATE: 3/25-26/97
OUTALL: 4/2/97
V2-0802

(Indicate comments with an * and document on General Comments page)

" *C. variegatus* "

GENERAL COMMENTS

JRA# 97-3349



NPDES#: N/A

CLIENT: Oceana OCU

OUTFALL: B-3

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	20.1	7.91	/	8.9	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 3/24 Date 3/27 Date 3/27 Date 3/28
 Method Method Method Time 1700 0950 1700 1020
 Minutes Amount Amount Init 053 106 106 106

DILUENT 20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	10.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			DS
Control	1000	100	0	Diluent + 1000	NUMBER OF ORGANISMS	DS		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	N/A		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: DS								

TEST CHAMBER SIZE: 250mL TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	203 226
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	DS VWR	digi-thermo	1046203 745 QC1	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 681

Sample ID: Feed S.

JRA ID: 97-3356

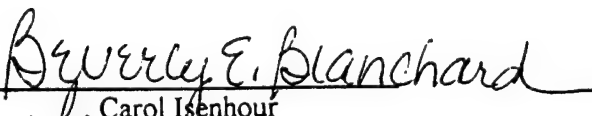
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


for Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3356

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:30

Test End: Date 3/28/97 Time 15:35

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): All vessels from test initiation

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.30 - 7.89</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3356 Test Type&Organism: Acute Mysidopsis bahia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.2 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: <u>Spearman-Karber</u>
Growth/Reproduction: <u>N/A</u>

JRA #: 97-3356 Test Type&Organism: Acute Mysisidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>33%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u>	thru <u>0.24</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Feed S. JRA #: 97-3356

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:35

Test End: 3/28/97 15:38

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): All vessels from test initiation

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.30 - 7.86</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3356 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>0.1 - 9.0</u>	<u>6.6 - 8.2</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>Spearman-Karber</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3356 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>34%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Feed S.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	<6.25	31		
2/28/97	Invalid	35		
3/12/97	17.7	52		
3/20/97	19.5	35		
3/26/97	33	34		

Toxicity Test Sample Chain of Custody
(Please complete all information)

PWC # 681



Facility ODU
Address Dept. Civil & Environ. Eng. ODU
Norfolk, VA 23508

County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____

Sample collected by (print & sign) _____ Affiliation _____

Type of sample ☒ (Grab): Date 03/25/97 Time 1:00 PM

_____ (Composite): From Date _____ Time _____

To Date _____ Time _____

Subsamples comprising composite:

Number Feed S. Frequency of collection _____ Volume 2 L.

Temperature of sample in sample collection device 26.0°C

Final temperature of effluent at sample collection point _____

Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____

It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? No dechlorinated? _____ If so, how? _____

Permit with interim chlorine limit? No. If yes - limit (mg/L) _____

Field pH 6.79 Field Total Residual Chlorine _____

Comments/Sample description Feed S.

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 1:00 PM

Received by Keith C. Felt Date 3-26-97 Time 11:00 AM

2. Relinquished by Keith C. Felt Date 3-26-97 Time 11:00

Received by Arthur Miller Date 3/26/97 Time 11:25 #681

See PWC C-0-C

FOR REED LAB USE ONLY

JRA# 97-3356 Arrival Temperature 2.4°C On ice? yes

Color tan Odor yeast Solids none

pH 7.17 DO (mg/L) 9.0 Conductivity (µmhos/cm) 100 @ 19.1 °C

Salinity (ppt) 1 TRC (mg/L) — Method —

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



P.O.C.: Douglas Kirk
COMMAND: Oregon

LAB USE ONLY		SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES /CONTAINERS	ANALYSIS	FIELD READINGS		PRESERVATION VERIFIED BY
LINE ITEM #													pH	TEMPERATURE	
000284	681	Feed. S	START	3/25/13	1300	G	Yang	L	1		1P	Bioassay		97-3356	asn
000285	685	DI water	STOP											97-3357	f
			START												
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			START												

COMMENTS:

D.O. NUMBER:	INIT.:
CONTRACT LAB:	DATE:
CONTRACT NO.(S):	

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S). *

***ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.**

2. SAMPLES RECEIVED AFTER 2:00 PM MON. -- THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM -- 3:30 PM).

•••FOR LAB USE ONLY!!!		CHECK BOX & INITIAL IF OKAY		SAMPLES VERIFICATION		DATE/TIME	
HOLDING TIME ()	CONTAINERS ()	INITIAL:	REJECTED ()	REASON:	INITIAL:	DATE/TIME:	DATE/TIME:
		RELINQUISHED BY: <i>[Signature]</i>	REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND:		DATE/TIME: 3/26/87	1230
		RELINQUISHED BY: <i>[Signature]</i>	REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND:		DATE/TIME: 3/26/87	1320
		RELINQUISHED BY: <i>[Signature]</i>	REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND:		DATE/TIME:	
		RELINQUISHED BY: <i>[Signature]</i>	REC'D BY: <i>[Signature]</i>	COMPANY/COMMAND:		DATE/TIME:	

CHAIN-OF-CUSTODY RECORD

& ANALYSIS REQUEST FORM

PWC ENVIRONMENTAL LABORATORY

CODE 930 BLDG Z-140

9742 MARYLAND AVENUE

NORFOLK, VA 23511 - 3095

PH: (757)445-8851 FAX: (757)445-8852



ENVIRONMENTAL

CLIENT INFORMATION

COMPANY/COMMAND: Ocean CODE: _____

CONTACT: Douglas Kirk

PHONE: 433-2131 EXT: _____ FAX: 433-2719

J.O. #: 1912290

SIGNATURE: DD B. L.

PERMIT NO.: _____

LAB USE ONLY LINE ITEM # SAMPLE NO	SAMPLE ID/LOCATION	SAMPLE TAKEN	ON DATE	AT TIME	TYPE	SAMPLED BY	MATRIX	PRESERVATIVE	# OF SAMPLES CONTAINERS	ANALYSIS	FIELD READINGS			PRESERVATION VERIFIED BY
											pH	TEMPERATURE	OTHER	
674	B-3	START	3/5/94	2100	G	Yng	L	1	1P	Brossard	97-3349	97-3350		AS
675	B-2	START		2100										
676	B-1	START		2100										
677	A-3	START		2100										
678	A-2	START		2100										
679	A-1	START		2100										
680	Mix L.P.R.	START		1300										

TYPE	MATRIX	CONTAINER	PRESERVATIVE
G - GRAB	L - LIQUID	B - BAG	1 - COOL TO 4°C
CF - COMPOSITE FLOW	S - SOLID	C - CARTRIDGE	2 - HNO ₃ pH<2
CT - COMPOSITE TIME	GS - GAS	T - TEFLON	3 - H ₂ SO ₄ pH<2
	SS - SEMI-SOLID	V - VOAL	4 - NaOH pH>12
		H - HEXANERINSE	5 - NONE

TURNAROUND (Days): _____ (FOR RUSH TURNAROUND STATE REASON BELOW)

COMMENTS: _____

REGULATION APPLIED:

RCRA () HRSO ()
SDWA () TSCA ()
CWA () PHOTO ()
CAA () OTHER ()

SAMPLE DISPOSAL: () RETURN TO CLIENT () DISPOSAL BY LAB

1. CUSTOMER IS RESPONSIBLE FOR ALL CHARGES NECESSARY FOR THE PROCESSING AND ANALYSIS OF SAMPLE(S).
*ALL RUSH SAMPLES ARE SUBJECT TO SURCHARGE.

2. SAMPLES RECEIVED AFTER 2:00 PM MON. - THURS. AND 1:00 PM ON FRIDAY WILL BE PROCESSED THE NEXT BUSINESS DAY (7:00 AM - 3:30 PM).

SAMPLING/COLLECTION CHARGE: \$ _____	
POSSIBLE SAMPLE HAZARDS: _____	
COMMENTS: _____	
D.O. NUMBER: _____	INITIAL: _____
CONTRACT LAB: _____	DATE: _____
CONTRACT NO.(S): _____	
OFFICIAL USE ONLY	

FOR LAB USE ONLY	CHECK BOX INITIALS OKAY	SAMPLES VERIFICATION	REJECTED ()	REASON:
HOLDING TIME ()	CONTAINERS ()	INITIAL:		
REINQUISHED BY: <u>Lightheadable</u>	REC'D BY: <u>pe</u>	COMPANY/COMMAND:	DATE/TIME: <u>3/26/94</u>	1233
REINQUISHED BY: <u>pe</u>	REC'D BY: <u>pe</u>	COMPANY/COMMAND:	DATE/TIME: <u>3/26/94</u>	1302
REINQUISHED BY: <u>pe</u>	REC'D BY: <u>pe</u>	COMPANY/COMMAND:	DATE/TIME: <u>3/26/94</u>	1302



NPDES#:

! ! A

CLIENT: Deana

2008

OUTFALL: Feed 2

ORGANISM SOURCE: ABS

JRA BATCH#: 6706

HATCH DATE: 3/22/97

[illegible]

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

LC50 = 34%

DATE: 3/26/97
 TOXICANT : Feed S.
 SPECIES: C. variegatus

TEST NUMBER: 97-3356

DURATION: 48 hours

RAW DATA: Concentration --- ---- (%)	Number Exposed	Mortalities
.00	20	0
6.25	20	0
12.50	20	0
25.00	20	1
50.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 34.15
 95% LOWER CONFIDENCE: 31.92
 95% UPPER CONFIDENCE: 36.54



OBSERVATIONS

JRA# 97-3354

VPDES#.

N/A

NPDES#: N/A CLIENT: Cultures
ORGANISM SOURCE: Chesapeake

CLIENT: Creed ADU

OUTFALL: Feed S.
DATE: 3/25/97

WATCH DATE: 3/25/97 1430-0800

Conc. (%) % Surv.	HOURS⇒	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)				pH (Day 0: 6.0 - 9.0)				DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)				TEMPERATURE (19 - 21°C)				SALINITY (19 - 21ppt)	
			0	24	48		0	24	48		0	24	48		0	24	48		0	END
0	A		10	10	10		8.44	8.28	8.24	48					24.5	24.1	24.1		20	
100	B		10	10	10															
625	A		10	10	10		8.34	8.18	8.19	48					24.5	24.1	24.1		20	
100	B		10	10	10															
125	A		10	10	10		8.26	8.23	8.23	48					24.4	24.1	24.1		20	
95	B		10	10	9			8.13												
25	A		10	10	10		8.14	7.87	8.32	48					24.4	24.1	24.1		20	
95	B		10	10	9			8.23												
50	A		10	1	0		7.88	7.97	8.53	48					24.2	24.1	24.1		20	
0	B		10	1	0															
100	A		10	0	-		7.30	7.89	-	48					19.1	20.1	-		20	
0	B		10	0	-															

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

LC50 = 33%

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 3/26/97
TOXICANT : Feed S.
SPECIES: M. bahia

TEST NUMBER: 97-3356

DURATION: 48 hours

RAW DATA:	Concentration	Number	Mortalities
--- ----	(%)	Exposed	
	.00	20	0
	6.25	20	0
	12.50	20	1
	25.00	20	1
	50.00	20	20
	100.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 32.99
95% LOWER CONFIDENCE: 29.98
95% UPPER CONFIDENCE: 36.29

Acute *Mysidopsis bahia* Toxicity Test" *C. variegatus* " " "

GENERAL COMMENTS

JRA# 97-3356

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: Feed

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)



DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 1300	3/26/97	19.1	7.30	/	9.0	/	1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/26 Date 3/27 Date 3/28
 Method 1700 Method 0950 Method 1700 Method 1000
 Minutes Amount Amount Init 183 106 106 106

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	22.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (% mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (% mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	183		
6.25	↓	↓	62.5	↓	STATISTICAL ANALYSES	183		
12.5	↓	↓	125	↓				
25	↓	↓	250	↓				
50	↓	↓	500	↓				
100	↓	↓	1000	0				
CALCULATIONS PERFORMED BY: <u>183</u>								

TEST CHAMBER SIZE: 250ml TYPE: Polystyrene VOLUME OF TEST SOLUTION: 200ml

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digit-thermo	<u>1046303</u>	<u>745 DC1</u>
Chlorine	Fischer & Porter	821A009U73	8811A940230-1	A

COMMENTS:

all vessels aerated.



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 680

Sample ID: Mix L. R.R.

JRA ID: 97-3355

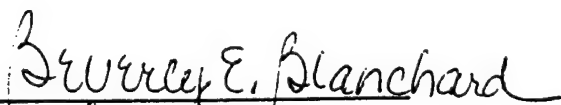
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,



Carol Isenhour
for Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3355

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>3/26/97</u>	Time <u>16:30</u>
Test End:	<u>3/28/97</u>	<u>16:02</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Mysidopsis bahia</u>	Age: <u>1 day</u>
Test Chamber Size:	<u>250 mL</u>	
Volume of Test Solution per Chamber:	<u>200 mL</u>	
Diluent:	<u>20 ppt Forty Fathoms</u>	
Aeration Period (if necessary):	<u>None</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.98 - 8.24</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3355 Test Type&Organism: Acute *Mysidopsis bahia*

RANGE OF CHEMICAL PARAMETERS (Continued)

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.6 - 8.9</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3355 Test Type&Organism: Acute *Mysidopsis bahia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: Mix L. R.R. JRA #: 97-3355

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:35

Test End: 3/28/97 16:15

Test Type (chronic/acute): Acute

Test Organism: Cyprinodon variegatus Age: 4 days

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>7.98 - 8.24</u>	<u>8.28 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3355 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 8.9</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3355 Test Type&Organism: Acute (Cyprinodon variegatus)

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u> thru <u>36</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

Mix L. R.R.

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
2/12/97	>100	>100		
2/28/97	Invalid	>100		
3/12/97	>100	>100		
3/20/97	>100	>100		
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

pwc # 680



Facility ODU
Address Dept. Civil & Environ. Eng. ODU
Norfolk, VA - 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print & sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 1:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number Mix L RR Frequency of collection _____ Volume 2L
Temperature of sample in sample collection device 24.0°C
Final temperature of effluent at sample collection point _____
Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)
Is the sample chlorinated? No dechlorinated? _____ If so, how? _____
Permit with interim chlorine limit? No If yes - limit (mg/L) _____
Field pH 7.46 Field Total Residual Chlorine _____
Comments/Sample description Mix L RR

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid shrimp
Method of shipment cool

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 1:00 PM
Received by Kathy C. C. C. Date 3-26-97 Time 11:00
2. Relinquished by Kathy C. C. C. Date 3-26-97 Time 11:10
Received by Robert D. Miller Date 3/26/97 Time 11:25 #680
See PWC 6-0-0

FOR REED LAB USE ONLY

JRA# 97-3355 Arrival Temperature 8.4°C On ice? yes
Color tan Odor earthy Solids none
pH 7.80 DO (mg/L) 8.9 Conductivity (umhos/cm) 1800 @ 19.1 °C
Salinity (ppt) 1 TRC (mg/L) — Method —



IRA# 97-3355

OBSERVATIONS

Acute *Cyprinodon variegatus* Toxicity TestNPDES#: 111A CLIENT: Ocean DDU OUTFALL: Mix L.
ORGANISM SOURCE: ABS IRA BATCH#: C206 HATCH DATE: 3/22/97

Conc % % Surv.	HOURS →	REP ↓	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)			pH (Day 0: 6.0 - 9.0)			DISSOLVED OXYGEN (mg/L) (> 4.0, < 9.1 @ 20°C)			TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.44	8.25	8.24	8.44	8.25	8.24	20.5	19.5	19.7	20	20
100	B		10	10	10				6.6	7.7	8.2					
6.25	A		10	10	10	8.40	8.25	8.28	7.2	7.5	8.2	20.5	19.5	19.7	20	20
100	B		10	10	10											
12.5	A		10	10	10	8.38	8.25	8.24	7.3	7.7	8.2	20.5	19.5	19.7	20	20
100	B		10	10	10											
25	A		10	10	10	8.27	8.24	8.30	7.5	7.6	8.2	20.4	19.5	19.7	20	20
100	B		10	10	10											
50	A		10	10	10	8.19	8.20	8.24	8.0	7.6	8.2	20.0	19.5	19.7	20	20
100	B		10	10	10											
100	A		10	10	10	7.98	8.09	8.24	8.9	7.5	8.0	19.1	19.5	19.7	20	20
100	B		10	10	10											

INIT	053	053
DATE	3/26/97	3/28
TIME	1635	1645

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96



acute *Mysidopsis bahia* Toxicity Test

OBSERVATIONS

JRA# 97-355

IPDES#: N/A CLIENT: Ocean OUTFALL: MIX L
ORGANISM SOURCE: Chesapeake Bay JRA BATCH#: M454 HATCH DATE: 3/25-26/97 1430-0800

Conc (%) % Surv.	REP ↓	HOURS⇒	NUMBER OF LIVE ORGANISMS (Control ≥ 90%)		pH (Day 0: 6.0 - 9.0)		DISSOLVED OXYGEN (mg/L) (>4.0, <9.1 @ 20°C)		TEMPERATURE (19 - 21°C)			SALINITY (19 - 21ppt)	
			0	24	48	0	24	48	0	24	48	0	END
0	A		10	10	10	8.44	8.28	8.21	6.6	7.8	8.0	20	20
100	B		10	10	10								
6.25	A		10	10	10	8.40	8.25	8.24	7.2	7.7	7.6	20	20
100	B		10	10	10								
12.5	A		10	10	10	8.38	8.26	8.25	7.3	7.7	7.6	20	20
90	B		10	10	10								
25	A		10	10	10	8.27	8.24	8.26	7.5	7.7	7.6	20	20
100	B		10	10	10								
50	A		10	10	10	8.19	8.20	8.27	8.0	7.8	7.7	20	20
100	B		10	10	10								
100	A		10	10	10	7.98	8.10	8.24	8.9	7.6	7.7	20	20
100	B		10	10	10								

INIT	DSB	DSB	DSB
DATE 1997	3/26	3/27	3/28
TIME	1630	1636	1602

(Indicate comments with an * and document on General Comments page)

Rev 3/19/96

" C. variegatus "

GENERAL COMMENTS

NPDES#: N/A CLIENT: Oceana OyuOUTFALL: MIL

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L) >4;<9.1	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt) 19-21	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 1300	3/26/97	19.1	7.98		8.9		1	20		

DO Adj. pH Adj. TRC Adj. Feedings (Mysid)

Date 1997 Date 3/26 Date 3/27 Date 3/27 Date 3/28
 Method 1700 Method 0950 Method 1700 Method 1020
 Minutes Amount Amount Init 153 LOG LOG LOG

DILUENT (20ppt Forty Fathoms) 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS			
Control	1000	100	0	Dilute to 1000	NUMBER OF ORGANISMS	153		
6.25			62.5		STATISTICAL ANALYSES	N/A		
12.5			125					
25			250					
50			500					
100			1000					
CALCULATIONS PERFORMED BY: <u>153</u>								

TEST CHAMBER SIZE: 250mlTYPE: PolystyreneVOLUME OF TEST SOLUTION: 220ml

EQUIPMENT

	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	<u>226</u>
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	<u>VWR</u>	digi-thermo	<u>745 QC1</u>	N/A
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS:



April 3, 1997

Oceana - Old Dominion University

Contract No.: N00187-93-D-9748

Delivery Order: 0228-084

J.O. #: 1912290

Item No.: 0002BH, 0002BJ, 0003AD

NPDES Permit #: N/A

PWC #: 685

Sample ID: DI Water

JRA ID: 97-3357

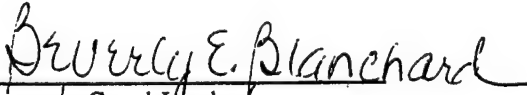
Performed for:

Merrill Anderson-Ashcraft
Navy Public Works Center
9742 Maryland Avenue
Code 930, Bldg. Z-140
Norfolk, VA 23511

Performed by:

James R. Reed & Associates
11864 Canon Blvd., Suite 103
Newport News, VA 23606

Respectfully,


Carol Isenhour
Vice President

JRA/jsc

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A

Outfall/Receiving Stream: DI Water JRA #: 97-3357

Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date Time
 3/26/97 16:30

Test End: 3/28/97 16:35

Test Type (chronic/acute): Acute

Test Organism: Mysidopsis bahia Age: 1 day

Test Chamber Size: 250 mL

Volume of Test Solution per Chamber: 200 mL

Diluent: 20 ppt Forty Fathoms

Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u>N/A</u>	<u><0.01</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.31 - 8.37</u>	<u>8.24 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3357 Test Type&Organism: Acute Mysidopsis bahia Screen

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (μmhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.4 - 9.0</u>	<u>6.6 - 8.0</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3357 Test Type&Organism: Acute Mysidopsis bahia

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/26/97</u>	
Result (mg/L)		<u>0.09</u>	
QC Range (mg/L)		<u>0.04</u> thru <u>0.24</u>	

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer & Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)

Facility: Oceana - ODU NPDES Permit #: N/A
Outfall/Receiving Stream: DI Water JRA #: 97-3357
Test Period for Which Data is Being Submitted: _____
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 3/26/97 Time 16:35
Test End: 3/28/97 16:35
Test Type (chronic/acute): Acute
Test Organism: Cyprinodon variegatus Age: 4 days
Test Chamber Size: 250 mL
Volume of Test Solution per Chamber: 200 mL
Diluent: 20 ppt Forty Fathoms
Aeration Period (if necessary): None

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>	<u>N/A</u>	<u><0.01</u>
Initial		
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u>1</u>	<u>20</u>
Adjusted	<u>20</u>	
3. <u>pH</u>		
Initial	<u>8.29 - 8.37</u>	<u>8.25 - 8.44</u>
Adjusted	<u>N/A</u>	

JRA #: 97-3357 Test Type&Organism: Acute *Cyprinodon variegatus*

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>N/A</u>	<u>N/A</u>
7. <u>Conductivity (umhos/cm)</u>	<u>N/A</u>	<u>N/A</u>
8. <u>DO (mg/L)</u>	<u>7.5 - 9.0</u>	<u>6.6 - 8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>Forty Fathoms</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>N/A</u>
Growth/Reproduction:	<u>N/A</u>

JRA #: 97-3357 Test Type&Organism: Acute *Cyprinodon variegatus*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50		<u>>100%</u>	
Survival	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Growth or Reproduction	(NOEC)	<u> </u>	(LOEC) <u> </u>
	Normal Distribution (yes/no)	<u> </u>	
	Homogeneous Variance (yes/no)	<u> </u>	
Reference Toxicant Test Date		<u>3/31/97</u>	
Result (mg/L)		<u>>40</u>	
QC Range (mg/L)		<u>2</u>	thru <u>36</u>

4. <u>Equipment</u>	(Make	Model	Serial #	Probe #)
pH meter	Corning	245	5147	G
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	digi-thermo	7A5 QC1	N/A
Chlorine	Fischer			
	& Porter	821A009423	8811A940230-1	A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

NPDES Permit #: N/A

Oceana - ODU

DI Water

Date of Test	Invertebrate LC50 %	Vertebrate LC50 %	Invertebrate NOEC %	Vertebrate NOEC %
3/26/97	>100	>100		

Toxicity Test Sample Chain of Custody
(Please complete all information)

PWC # 182
695



Facility ODU
Address Dept. Civil & Environ. Eng. ODU
Norfolk, VA 23508
County _____ Pipe/Outfall/Location _____
NPDES# _____ Instream Waste Conc _____
Sample collected by (print & sign) Yang Affiliation _____
Type of sample ☒ (Grab): Date 03/25/97 Time 9:00 PM
_____ (Composite): From Date _____ Time _____
To Date _____ Time _____

Subsamples comprising composite:

Number DI water Frequency of collection _____ Volume 2 L
Temperature of sample in sample collection device 25.0°C
Final temperature of effluent at sample collection point _____
Is sample collection device chilled? _____ Is sample packed on ice for shipment? _____
It is required that all samples remain at 0 - 4°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)
Is the sample chlorinated? No dechlorinated? _____ If so, how? _____
Permit with interim chlorine limit? No If yes - limit (mg/L) _____
Field pH 5.46 Field Total Residual Chlorine _____
Comments/Sample description DI water

Type of test(s) to be performed Acute Toxicity Testing
(Specify organisms) Cyprinodon Variegatus & Mysid Shrimp
Method of shipment Reel

Print & Sign Names

1. Relinquished by Yang Date 03/25/97 Time 9:00 PM
Received by Keith C. F. Date 3-26-97 Time 11:00 A.M.
2. Relinquished by Keith C. F. Date 3-26-97 Time 11:10 A.M.
Received by Recher Miller Date 3/26/97 Time 11:52 # 625
see PWC COC

FOR REED LAB USE ONLY

JRA# 97-3357 Arrival Temperature 2.4°C On ice? yes
Color Clear Odor none Solids none
pH 5.08 DO (mg/L) 9.0 Conductivity (µmhos/cm) <10 @ 19.4°C
Salinity (ppt) <1 TRC (mg/L) — Method _____

NPDES#: N/ACLIENT: Ocean ODUOUTFALL: DI WATER

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)

DATE	DAY	COLLECT DATE/TIME	ARRIVAL DATE	TEMP (°C) 19-21	INIT pH	FINAL pH 6-9	INIT DO (mg/L)	FINAL DO (mg/L) >4;<9.1	INIT SAL (ppt)	FINAL SAL (ppt) 19-21	INIT TRC (mg/L)	FINAL TRC (mg/L)
3/26/97	0	3/25/97 2100	3/26/97	19.4	8.37	/	9.0	/	<1	20	/	/

DO Adj. pH Adj. TRC Adj. Feedings Mysid

Date 1997 Date 3/26 Date 3/27 Date 3/27 Date 3/28 Date 3/29 Date 3/29 Date 3/30
 Method 1700 Method 0950 Method 1700 Method 1020 Method 1 Method 1 Method 1
 Minutes Amount Amount Init DS LOG LOG LOG LOG LOG

DILUENT (20ppt Forty Fathoms 20ppt Hawaiian Marine Mix Other _____) CIRCLE ONE

DATE	DAY	DATE MADE	TEMP (°C) 19-21	pH 6-9	DO (mg/L) >4;<9.1	SAL (ppt) 19-21	TRC (mg/L) <0.01
3/26/97	0	3/26/97	20.5	8.44	6.6	20	<0.01

TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES	INITIALS
CONC (mg/L) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (mg/L)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS	DSB		DSB
997.151	1000	100	—	1000	NUMBER OF ORGANISMS	DSB		
100	1000	100	1000	—	STATISTICAL ANALYSES	N/A		
CALCULATIONS PERFORMED BY: DSB								

TEST CHAMBER SIZE: 250mL TYPE: plastic VOLUME OF TEST SOLUTION: 200mL

EQUIPMENT	Make	Model	Serial Number	Probe Number
pH meter	Corning	245	5147	26
DO meter	YSI	54ARC	14522	N
SCT meter	YSI	33	4458	A
Temperature	VWR	diigi-thermo	745 QCI	n/a
Chlorine	Fischer & Porter	821A009U23	8811A940230-1	A

COMMENTS: